

G.O.C. STAFF RULE ABSTRACT

AGENCY: Department of Mental Health and Substance Abuse Services, Division of Administrative and Regulatory Services

SUBJECT: Minimum Program Requirements for Nonresidential Office-Based Opiate Treatment Facilities (OBOTs)

STATUTORY AUTHORITY: Chapter 912 of the Public Acts of 2016 (Section 5)

EFFECTIVE DATES: January 12, 2017 through June 30, 2017

FISCAL IMPACT: Minimal

STAFF RULE ABSTRACT: According to the Department, the rulemaking hearing rule implements best practices in the area of office-based opiate treatment while ensuring that Tennesseans have continued access to this important treatment options.

Rule 0940-05-35-.02 establishes definitions for terms commonly used in the rules.

Rule 0940-05-35-.03 identifies other rules that are applicable to entities licensed under this rule.

Rule 0940-05-35-.04 establishes procedures for entities applying for licensure, including, but not limited to, provisions regarding ownership, application for licensure, renewal of licensure, licensure fees, the Department's authority to conduct investigations in order to ensure compliance with the rules, etc.

Rule 0940-05-35-.06 establishes procedures regarding admission and discharge from an OBOT and requires that these admission and discharge procedures be carried out in accordance with peer reviewed medication assisted treatment guidelines developed by nationally recognized organizations.

Rule 0940-05-35-.07 establishes patient records requirements for OBOTs, including, but not limited to, ensuring patient consent to treatment, ensuring that patients are informed of the OBOT's rules for patient conduct and responsibilities, and ensuring

adequate billing and medical record retention and maintenance in accordance with Tenn. Code Ann., Section 33-2-403(e),(f), and (g).

Rule 0940-05-35-.09 requires OBOTs to create individualized treatment plans for their patients and ensure that each individualized treatment plan is created in accordance with peer reviewed medication assisted treatment guidelines developed by nationally recognized organizations. Individualized treatment plans shall address the frequency of random observed drug screens, office visits, and counseling sessions.

Rule 0940-05-35-.10 establishes requirements regarding the treatment of special populations at the OBOTs, including pregnant women and women of child bearing age and potential, patients engaged in pain management, patients living with co-occurring disorders, patients who have engaged, or who are engaging, in polysubstance abuse, and patients who are currently in the criminal justice system.

Rule 0940-05-35-.11 identifies counseling as an essential element to medication assisted treatment provided at an OBOT and requires OBOTs to be responsible for determining and documenting that counseling is being received and that their patients are progressing towards meeting the goals listed in their individualized treatment plans.

Rule 0940-05-35-.12 establishes requirements regarding medication management, including prescribing practices, the use of benzodiazepines, checking of the controlled substances monitoring database, the development of guidelines for the review of prescriptions from other providers, etc.

Rule 0940-05-35-.13 requires OBOTs to use drug screens for the purpose of assessing a patient's abuse of drugs and evaluating the patient's progress in treatment and sets out basic provisions regarding the collection and documentation of those drug screens.

Rule 0940-05-35-.14 & 15 establish requirements regarding detoxification and medically supervised withdrawal and the implementation of diversion control plans.

Rule 0940-05-35-.16 contains reporting requirements regarding: correspondence between the licensed provider and various government agencies (Tennessee Department of Health, FDA, DEA, SAMHSA, etc.); reports and information to assist in determining the effectiveness of medication assisted therapy and how that treatment is delivered; information on significant occurrences at the Facility, including death or serious injury or any action taken against the Facility by the DEA, accrediting body or other local, state, or federal agency; responses to citations for violation of the proposed rules or citations from other agencies.

Rule 0940-05-35-.17 establishes patient rights at an OBOT.

Rule 0940-05-35-.18 establishes requirements regarding community relations between OBOTs and the communities in which they are located and require documentation of community relation efforts and community contacts.

Rule 0940-05-35-.19 establishes personnel and staffing requirements for OBOTs, including standard qualifications for an OBOT's medical director, facility director, program physicians, and other qualified providers.

Public Hearing Comments

One copy of a document containing responses to comments made at the public hearing must accompany the filing pursuant to T.C.A. § 4-5-222. Agencies shall include only their responses to public hearing comments, which can be summarized. No letters of inquiry from parties questioning the rule will be accepted. When no comments are received at the public hearing, the agency need only draft a memorandum stating such and include it with the Rulemaking Hearing Rule filing. Minutes of the meeting will not be accepted. Transcripts are not acceptable.

TDMHSAS Responses to Comments about
Rules Chapter 0940-05-35
Minimum Program Requirements for Nonresidential Office-Based Opiate Treatment Facilities
made prior to, during, or after the
Rulemaking Hearing held on August 30, 2016

**The Department has attempted to present the following comments in a form that is both easy to read and accurate to the intent of the commenter. In rare cases, the Department made technical edits to increase the readability of a comment. Please forgive any typographical errors in both the comments and responses.*

GENERAL COMMENTS

MICHAELA D. POIZNER, ATTORNEY (BAKER, DONELSON, BEARMAN, CALDWELL & BERKOWITZ, PC): Do I understand that (assuming these rules are promulgated as proposed), a physician practice that does not prescribe more buprenorphine to more than 150 patients will not need to be licensed as an OBOT?

WES WEIGEL, YOST ROBERTSON NOWAK PLLC, WILLIAMSON COUNTY ESCROW & TITLE, INC.: Under the proposed rules, if a clinic stayed under the 150 patient limit, are those clinics exempt from the proposed rules?

ROBERT SHEARER, M.D.: My question regards the limits, I understand that you are putting it at 149 but isn't one of the biggest problems that we deal with is the cash-pay patient that are seen 4 hours or 6 hours at 200-300 dollars a pop? And does this do anything to diminish that type of care?

Kurt Hippel: The [patient threshold] is statutorily set...[at] 150 and above AND 50% or more, that is the extent of our authority to promulgate rules.

Dr. Lloyd: One of the things that Dr. Mutter said was the establishment instead of practiced guidelines that would apply across the board no matter if you had 200 patients or 1 patient which is what I think you are talking about

Dr. Shearer: Right.

Dr. Loyd: So whenever you have practitioners, I think Dr. Conway pointed this out too, letting the BME handle those, well, in order to do that you have to have a set of guidelines that you can match medical records against to see where you are not meeting this standard or that standard. So I think that is something that we look forward, you know and your point is well taken, I think that is something that is a part of the process as we go on.

TDMHSAS Response: Yes. Only professional practices “prescribing products containing buprenorphine, or products containing any other controlled substance designed to treat opiate addiction by preventing symptoms of withdrawal to fifty percent (50%) or more of its patients and to one hundred fifty (150) or more patients” would need to be licensed as an OBOT. Ex. If a professional practice has 149 patients being prescribed buprenorphine to treat opiate addiction by preventing symptoms of withdrawal, then that professional practice would not need to be licensed as an OBOT.

MITCHELL MUTTER, M.D., TENNESSEE DEPARTMENT OF HEALTH: If a patient was on MAT and then went to abstinence and just doing follow-up visits, [the patient] no longer counts then toward the 150 patient threshold, is that right?

The 150 patients is per facility not provider, so if you have 4 prescribers in a facility, it's not 600 patients they can serve, it's 150 for the entire OBOT facility.

TDMHSAS Response: Dr. Mutter is correct regarding both of his above comments.

MICHAELA D. POIZNER, ATTORNEY (BAKER, DONELSON, BEARMAN, CALDWELL & BERKOWITZ, PC): If a physician practice obtains a license as an OBOT, will that OBOT require a CON? I believe, based on the recently amended T.C.A. § 68-11-1602 (7)(B)(iii), that an OBOT will still be exempt from the CON requirements if it is "exclusively the professional practice office of a physician," (the words of § 68-11-1602(7)(B)(iii) and the OBOT prescribes Suboxone to fewer than 150 patients. Is that correct?

TDMHSAS Response: A CON is not required to operate an OBOT. Additionally, nonresidential opioid treatment program facilities (OTP) and nonresidential office-based opiate treatment facilities (OBOT) are two different licensure categories and will be governed by two separate sets of licensure rules. An OTP facility requires licensure by TDMHSAS and a CON from the HSDA. An OBOT facility requires only a license from TDMHSAS.

MARIE CROSSON, Ph.D., EXECUTIVE DIRECTOR, TENNESSEE ASSOCIATION OF DRUG COURT PROFESSIONALS (TADCP): The Regional Judicial Opioid Summit held August 23 through 26, 2016 in Cincinnati, Ohio, was the beginning of a year-long effort, convened due to the National Opioid Epidemic that has its epicenter in our 9 state region (Ohio, Michigan, Pennsylvania, Virginia, West Virginia, Kentucky, Indiana, and Illinois). In this first of its kind effort, there was recognition that the epidemic would be most effectively addressed through the convergence of multidiscipline, collaborative approaches both intrastate and across states. Together we discussed ways to improve our state and regional responses. The Tennessee delegation that included 12 individuals, outlined a plan to build on the amazing work that has already been done, as well as a commitment to return to Tennessee and encourage participation in a regional strategy.

The Tennessee delegation recognizes and appreciates the difficult and tedious work it has taken thus far to develop the proposed rules, and we believe they are a solid step in the right direction. Based on our expertise, conversations with the other states at the Summit, and our own state discussions, we would like to make the following two recommendations regarding the draft rules for Tennessee Outpatient Buprenorphine Clinics:

1. To establish state and regional, best practice guidelines for Opioid-Based Medication Assisted Treatment with consideration of the following:
 - a. Development of a regional network of physicians to be designated prescribers of opioid-based MAT for recovery courts, DCS referrals, services to opioid dependent pregnant women, and other locuses of care.
 - b. For DMHSAS to provide assistance and feedback to locate appropriate prescribers for the network.
 - c. To ensure these designated prescribers understand the expectations and responsibilities, the regional network and MAT guidelines would need to be in place prior to new referrals.
 - d. To solicit feedback from stakeholders, specifically recovery courts and child welfare agencies and the courts with which they work to ensure the guidelines meet the needs of their participants and clients. Recovery court judges as a whole will not embrace opioid-based MAT without concise, quality, best practice treatment services delivered by providers able and willing to adhere to guidelines such as these and who will also work closely with their programs. Child welfare providers and the judges they work with would also be more open to support a system designed with an emphasis on the "assisted" and "treatment" portions of a Medication Assisted Treatment modality.
 - e. Representatives of these designated prescribers would be expected to attend recovery court staffings when there are participants engaged in MAT to help monitor and provide treatment continuity.
 - f. To include case management and clinical therapy guidelines that align with best practices in the field and offer optimal opportunity for effective treatment and continuum of care services.
2. Neonatal Abstinence Syndrome guidelines need to be more robust with consideration of the following:
 - a. Physicians need to have protocols to routinely urine drug screen with a confirmed pregnancy
 - b. Mandatory pregnancy testing for all women of child bearing age accessing MAT services.
 - c. Women receiving MAT to also receive education on the risks and benefits of voluntary long-acting contraception

- d. Women receiving MAT to be educated at regular intervals on the effects, risks and benefits of MAT
- e. To explore the implementation of new detox protocols for opioid-addicted pregnant women based on recent research by Dr. Craig Towers at the University of Tennessee Medical Center

Discussions among the 9 states represented at the Regional Judicial Opioid Summit mirror our recommendations. These are statewide and interstate discussions that are ongoing between the 9 delegations. We respectfully submit them for your consideration.

TDMHSAS Response: The Department acknowledges Dr. Crosson's concerns regarding best practices and neonatal abstinence syndrome.

Chapter 912 of the Public Acts of 2016 requires the Department's adherence to nationally-recognized medication-assisted treatment guidelines for the development of these proposed rules.

Furthermore, the proposed rules require OBOTs to utilize best practices for admission and discharge procedures and in developing individualized treatment plans for patients. By requiring OBOTs to adhere to nationally-recognized medication-assisted treatment guidelines, the proposed rules ensure that neonatal abstinence syndrome education and prevention strategies are provided by the OBOT to its patients.

JAMES MANUELE, M.D., FACOG: Treating opiate addiction is not rocket science. Frankly, it's not that hard. Patients need to be treated with compassion, honesty and respect. Providers need to ensure patients receive counseling addressing their patients' personal specific issues and needs. Physicians should drug screen their patients to ensure compliance, check for relapse and help prevent diversion. Prior to handing a patient a prescription for a controlled substance, the CSMD should be checked to avoid diversion and duplicate or conflicting treatment. There's your frame work. Instead we have pages of rules that denigrate patients, increase cost and bureaucracy and, in my opinion, more often than not miss the mark.

Any regulations or rules created to address the treatment of opiate addiction should meet the following criteria:

1. They improve access to affordable treatment
2. They improve the quality of treatment
3. They should not place any increased barriers, be they financial or bureaucratic, between patients and their ability to receive quality care.
4. They should address and seek to decrease opportunities for diversion.
5. Respect the rights and dignity of patients.

Unfortunately, the rules proposed by the Department of Mental Health and Substance Abuse Services fail to meet many of these criteria. The proposed rules represent a bureaucratic morass and power grab that will ultimately harm patients and negatively impact the treatment of the opiate epidemic in our State. Several of the proposed rules represent barriers to treatment and violate patients' rights to not be discriminated against. When the proposed rules don't adversely impact care or access, they ignore the Constitution and place undue administrative burdens on providers. Such burdens will result in fewer providers willing to navigate the rules, tolerate the intrusion or bear the expense required to continue treating opiate addiction. Those providers that stay the course, will be faced with increased costs to meet requirements that do little to address the original goals.

When costs are increased, ultimately the consumer bears them. If we as Tennesseans make the cost too high, whether financially or by making treatment so time consuming and intrusive that patients and providers can't afford it, we will end up with more crime and more patients dying from overdose as they turn to the street where it's easier and cheaper to obtain illicit drugs.

The proposed rules miss the mark and instead represent a boon of new work for the Department of Mental Health while becoming a hindrance to effectively treating both patients and the epidemic of opioid abuse in Tennessee.

We need to remember that every addict is someone's mother or daughter, brother or father. They are your neighbors, your co-workers, your waitress, your boss or your priest. There is no special class or group that is immune from opiate addiction. If these rules survive as written, we have to ask ourselves, which of these people do we wish to lose?

TDMHSAS Response: The Department recognizes the concerns addressed in Dr. Manuele's

comments. These proposed rules are written so as to achieve the dual goals of ensuring effective, efficient, and safe delivery of office-based opiate treatment services while limiting the regulatory burden on licensed providers. In order to accomplish these goals, the Department sought the input of a wide-variety of stakeholders, including a committee of experts that included several practicing addiction medicine physicians (T.C.A. 4-5-205(c)), some of which were small business owners, and conducted extensive research on best practices regarding office-based opiate treatment. These proposed rules will increase the quality of care provided to individuals who access treatment from a licensed provider.

ALEXANDER ZOTOS, M.D. FASAM, PRESIDENT, TENNESSEE SOCIETY OF ADDICTION MEDICINE: I would like to thank the Department of Mental Health And Substance Abuse Services for taking action on this issue regarding treatment facilities which dispense buprenorphine. High quality and affordable treatment will benefit the patients and public most in the State of Tennessee. The public must be protected from predatory practices and low quality of care. [At this point in his written comments, Dr. Zotos made several comments about specific provisions of the proposed rules. Dr. Zotos' comments regarding specific rules are laid out and addressed later in this document under "Specific Comments".]

In essence, these rules were intended to control and regulate bad practices and larger clinic type settings; however, they do potentially restrict the solo provider from seeing more than 150 as the costs would go up for the patient due to the costs of all the requirements and ultimately limit the number of patients someone in a small practice would see. Ultimately, it benefits the "big" guys and pushes the smaller guys out indirectly. This is just my opinion but my prediction is that larger entities will "pop" up in communities, which is what they don't want. It also restricts trade as a solo physician. The number should be at least 200 to sustain a low cost practice. Thank you for consideration.

TDMHSAS Response: The Department concurs in part. However, Chapter 912 of the Public Acts of 2016 statutorily defines an office-based opiate treatment facility as an entity "prescribing products containing buprenorphine...to fifty percent (50%) or more of its patients and one hundred fifty (150) or more patients." The proposed rules define office-based opiate treatment facilities using the statutory definition of an OBOT as determined by the legislature.

MITCHELL MUTTER, M.D., TENNESSEE DEPARTMENT OF HEALTH: It would be interesting to know the estimated cost of this rule to both the provider and the state?

All standards of care should be in guidelines, not in rules, since standards of care change. Guidelines can be changed quickly...rules not so. UDS assays changes so they should be in guidelines as well.

The other thing I would ask is that you would report to DOH vital statistics and the data warehouse any deaths because that is another piece of data that we keep and we are creating the data warehouse to run that against Buprenorphine or run that against pain management data or opiate prescribing. That is being put into effect right now. Dr. McPeters is in charge of that but Laurie Ferrante is in charge of Tennessee Department of Health (TDOH) vital statistics section.

TDMHSAS Response: The Department acknowledges Dr. Mutter's general comments regarding addiction medicine guidelines.

As for reporting certain information regarding OBOTs to TDOH vital statistics, the Department agrees that the proposed action would have a positive impact and the Department will work with TDOH as to how to accomplish this suggestion, while adhering to all state and federal confidentiality regulations and statutes.

Attached to the proposed rule is a "Regulatory Flexibility Addendum", an "Economic Impact Statement", and an "Impact on Local Governments" statement, which the Department has filed in accordance with the Uniform Administrative Procedures Act and for the purpose of assessing the impact these rules will have on both providers, many of which are small businesses, and local governments. The proposed rules' impact on the Department will not be significant (see Fiscal Note for SB829/HB929/Chapter 912 of the Public Acts of 2016) due to two reasons: 1. although the number of additional facilities that will be licensed as a result of the bill as amended is unknown, but it is estimated that the additional inspections and licensure procedures can be accommodated within the existing resources of the Department without a significant increase in expenditures; and 2. additional revenue will be collected by the Department through licensure fees paid by the Facilities; this additional revenue will cover any increased costs incurred by the Department for the additional licensure inspections and

workload.

DR. EVANN HERRELL, EHC MEDICAL, KNOXVILLE: I would like to thank the Department for all the efforts that have been made. I would like to echo what Dr. Loyd [in his opening remarks] said this morning, this is what we deal with on a daily basis and our hope is that these proceedings and all of this discussion and all of the comments that are submitted, what will come out of this will be a reasonable set of rules that enables doctors to practice evidence based medicine. But will also not cause any infringement on patient access to care because it is very true what Dr. Loyd said, we have hundreds of people dying in this country every day, and I know that in the State of Tennessee the death toll has increased dramatically since last year. So that's all we are looking for is to be able to provide good care to patients.

TDMHSAS Response: The Department concurs.

BOB STUBBLEFIELD, SERENITY CENTERS OF TN, KNOXVILLE: I have been involved with operations in substance abuse treatment centers on an outpatient or inpatient basis for about 31 years, my comments I will send in written I would just like to voice some concerns. A lot of times this language right here for someone like me or intensive outpatient programs are almost like we don't count. It's like we're just there, I mean it's that has a concern for me that that would be that way. We've been operating facilities and now I understand the reasoning we don't want a bunch of people coming into drug r us or setting up a chain of stuff across the state, I got that, but those of us who have been operating a legitimate treatment program for a number of years we have included medically assisted treatment, I've done that, did that years ago, tie it into an intensive outpatient program, we've done that legitimately. Some of this may be problematic to us. I also have issues and I'll go into detail about this that really concerns me about the application of ASAM criteria and ASI, these folks, especially in highly toxic living environments. Where as long as we are giving them the Suboxone correctly, and we're offering referral if they keep relapsing, but does it say they must take a referral you must discontinue people continuing to substance relapse. It leaves an out for people just to continue getting strips and not changing lifestyle. Those would be concerns I have and the first in particular little detail things that I'll write today, wanting to put doctors on my board of directors and things of that nature. If I've got 2-3 doctors sitting there together not affiliated in a practice and they are going to tell me who my facility director is going to be so if I hired a competent person with degrees and credentials out the ying-yang the language in here says I don't have a say in who I can hire for the facility director that is a doctor, that is a big headache I have but I am glad we are moving this way, I am glad we are getting out of the fly by night catch us if you can, you know the people who is giving us all a bad name. I am tickled to death that we have this going on and going to put some order to the chaos that we have out here, order to the malpractice, the malprescribing of this medication. It is a great tool; I would like to see it used as an appropriate tool. Thank you.

TDMHSAS Response: [The Department did not receive further written comments from Mr. Stubblefield.]

The Department concurs in part and respectfully disagrees in part.

The Department believes that it is important for doctors to maintain an ownership role in an OBOT facility due to the medical nature of the treatment provided at such a facility. However, there are no requirements in these proposed rules describing who is responsible for hiring the facility director. The proposed rules require that the governing body recognizes the facility director by designating them in writing.

Furthermore, regarding the comment about making referrals for higher levels of care, the proposed rules would require a referral be made for higher levels of care, if indicated. However, higher levels of care may be unavailable, unaffordable, or inaccessible and any actions made to a patient that refuses a referral to a higher level of care is at the discretion of the facility, in the best interests of the patient.

MARY LINDEN SALTER, L.C.S.W., EXECUTIVE DIRECTOR, TAADAS: On behalf of the Tennessee Association of Alcohol, Drug & other Addiction Services (TAADAS) and our members, I have consolidated our primary comments regarding the newly proposed licensure rules for Non-residential Office-based Opiate Treatment Facilities (Ch. 0940-05-35). TAADAS is a statewide association of alcohol and drug abuse service professionals and providers that represents over 52 state funded non-profit treatment providers as well as 26 individual and affiliate members.

TAADAS supports the regulation of Nonresidential Office-based Opiate treatment providers and believes that regulations in support of evidence based practice for this level of care are needed. We recognize that these rules

are a first step towards appropriate regulation of out-patient opiate treatment. In general, we find the proposed rules provide the structure needed to shape treatment practice that is modeled after evidence based programs. We also urge TDMHSAS to develop practice guidelines for medication assisted treatment (MAT) and opiate detoxification prescribing that will enhance the minimum and maximum standards that can be regulated in the administrative code. TAADAS recommends the following additional points be considered for the proposed rules.

First, we feel it is important for MAT providers to educate women of child-bearing age about MAT use while pregnant. This education should be repeated at regular intervals and include a referral for contraception counseling as needed. Given the number of prescriptions for opiates to women in this age range, we know that many will seek opiate treatment and need to understand the risks to a pregnancy and to their child. We would appreciate this being added to the current proposed rule.

Finally, addiction is a chronic disease and requires a chronic disease approach in its treatment. We support the addition of case management into this level of care as community coordination should be required for any office-based practitioner to be successful. Implementing case management as part of the rules for this level of care would be an important step towards recognizing the importance of recovery support, recognizing the care coordination of needs of these patients and supporting a chronic disease model for addiction treatment. The role of clinician and case manager should be distinct and unique. Our comments on the minimum standards for each role assume that to be the case. In order to ensure that the case management services are meaningful, we believe that case load size should be regulated and should not exceed 75. In addition, we would like to see a minimum of two case management contracts per month with one being face to face. We would encourage that the minimum qualification for a case manager include persons with who are Certified Peer Recovery Support staff.

Thank you for your consideration of our comments. TAADAS appreciates all the hard work that went into developing these proposed rules. We look forward to continued discussion about these rules as they are finalized and implemented. I am happy to provide you and your colleagues at TDMHSAS with any clarification or information that would be helpful.

TDMHSAS Response: The Department concurs with the comments made by Ms. Salter. The proposed rules require that female patients of child bearing age and potential to acknowledge, in writing, that they have received education on neonatal abstinence syndrome and the use of long-acting reversible contraceptives.

The Department acknowledges the importance of ensuring that a Facility provides sufficient case management services and believes this can be accomplished via a medical director's review of patient charts to ensure that the minimum number of case management services are being provided.

The Department acknowledges the recommendation for having certified peer recovery support staff as case managers and will take it under advisement.

CHARLIE HYATT, TENNESSEE ASSOCIATION FOR ADDICTION PROFESSIONALS: I am here to our organization wished to endorse the letter that TAADAS has presented to you fully. And make particular note concerning the counseling. For anyone who has ever worked in MAT before it is a unique form of counseling and the requirements need to be increased in order to reflect a person's knowledge of working in that particular area. One of our other concerns that is not mentioned on the letter, concerns the drug screening process. Traditionally, in drug screening process primary counselors are responsible for observing drug screenings on their patients this is very damaging to the therapeutic alignment between therapists and client and we recommend that there be some inclusion or notation that observed drug screens must be performed by medical personnel only or singular designated staff in the physician's office.

TDMHSAS Response: The Department concurs with the recommendation to modify the definition for "Observed Drug Screen" to specify that staff observing the drug screen be a member of the medical or lab staff that is either employed or contracted by the facility.

DR. TOM REACH, PRESIDENT, WATAUGA RECOVERY CENTER, JOHNSON CITY: We are now treating 3500 patients with Buprenorphine over a 3 state area. I want to thank all the members of the committee and the board especially Dr. Loyd and Kurt Hippel for excellent and diligent work in coming up with rules and regulations. As you know we've gone through several renditions of this already, there are still a few fine points which I think need some polish which I will submit to you in writing. In the state of the opiate epidemic that we have in Tennessee where we have literally tens of thousands of patients that need to be treated and only a fraction of that receiving care, anything that restricts access to care is going to cost people their lives. and so we have to balance, clearly we need rules and regulations to regulate overprescribing inadequate care, inadequate

counseling, that is why we are here, but on the other hand we don't want to be overly restrictive and put too much of a burden on facilities that are already doing all of those things right that might cause them to offer less adequate care. So in the points that I point out we have to be very careful in about how we do this.... [At this point in his written comments, Dr. Reach makes a couple of comments about specific provisions of the proposed rules. The comments regarding these specific provisions of the proposed rules are laid out and addressed later in this document under "Specific Comments".] But other than that I think that everyone has done an excellent job and the other details I think some of them are typos and a few word changes. Thank you very much.

TDMHSAS Response: The Department concurs.

KAREN KERSHING, METRO DRUG COALITION, KNOXVILLE: We are a substance abuse prevention organization. And the only thing I want to add, I had a lot of comments that were covered very thoroughly earlier especially for the women that are pregnant that need to be in treatment really need to be addressed in prevention with those women. But the other thing that has not been mentioned yet is trauma assessment being part of the comprehensive assessment. I didn't see that spelled out in the rules and definitely SAMHSA has been pushing trauma in the form of treatment for quite a number of years now, so we know there is a huge link especially between females in a history of trauma and if you don't deal with that trauma you are going to have a hard time keeping them maintain recovery.

TDMHSAS Response: The Department acknowledges the concern presented by Ms. Pershing. Under the proposed rules, the comprehensive assessment must be completed in accordance with peer reviewed medication assisted treatment guidelines and "trauma-informed" treatment services will likely be addressed under those guidelines (See SAMHSA's TIP 40).

DR. RICHARD SOPER: I'm here as a professor with the soon to be launched, in November, chair of excellence and addiction at the University of Tennessee in Memphis. We will be one of the 9 centers in the country. I'm also here as someone who sits on the national board of the drug courts of professionals. We did not compare notes believe it or not, but part of the reason I am here is that yes we at the University of TN Memphis and the center are communicating with Vanderbilt, ETSU and with Meharry and we hope to be that conduit that provides the guidelines for referral network or basis of physicians. But first and above all I think that it is hard to legislate the art of medicine. I think and I hope that this room as we have many of our associates and colleagues here that we continue to melt the silence that we continue to communicate. [Regarding] guidelines, I am not sure we need to continue to tighten down versus we [need to] follow the guidelines of ASAM. With all respect to some prior presentations in that we allow ourselves to continue to communicate, educate, and to advocate for our citizens in the state of Tennessee. We are one of the leading states in the country, not only with the database but with many of our other [efforts]. We were the first state to have physician's health program as most of you know. SO addiction is real here, so we want to work together.

TDMHSAS Response: The Department acknowledges the comments submitted by Dr. Soper.

AL GRANIER, C.E.O., ETM, LLC: We are affiliated with a company that professionally in the education business for over 21 years. We provide 1 in 14 k-12 children in the United States with eh voice data video and distance learning technology to about 6000 locations. We created ETM to move into the healthcare business with the idea of educating patients which seems to be the focus of your rules and regulations and certainly my conversations with medical professionals. We have done thousands of chronic pain patients in pain clinics. We have spoken to the leadership, doctors and clinicians in over 200 pain clinics. I am prepared to state to you, I don't have documented evidence, but I would say that 95% of these folks are simply having a receptionist having them sign an informed consent. To our knowledge there is little or no patient education occurring in our system. We work with the TBI, the DEA and the Tennessee Drug task force and they feel that this is very unfortunate but apparently your guidelines do not have teeth in them and do not appear to be enforced. We have just signed a memo of understanding with the Knox Co. Health Dept. and the Mayor of the City of Knoxville; we are installing 5 locations in Knoxville who will pilot an education program. I have spoken to Dr. Varney and Mr. Jones pervious on the importance of education and some of the methodologies to do it. We stand ready to work with the state in any and every capacity possible to facilitate this. We particularly are focused with the locations in Knoxville on child-bearing aged women who are not getting any information to the best we can discover of any nature about what you and Dr. Mutter and Dr. Warren have said. The vision of and that is preventing people that are of child-bearing age that are under chronic care treatment, giving them all the information they need for long acting reversible contraceptives. Again we look forward to working with you and I'm standing for questions if you have any.

TDMHSAS Response: The Department acknowledges comments submitted by Mr. Granier.

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: think the purpose of the regulations is public safety and I think it is very well written what you have done. I think you can protect public safety with your recommendations and I think obviously your capacity to recommend to the board of medical examiners is profound and powerful, given that, I would go to [Gov. Kasich] of Ohio and say let's use common sense regulation. These are small physician practices, these are the one who will be innovating. The one who are not doing well send to the state medical board, this is pretty straight forward. Thank you for your public services.

Dr. Lloyd: You are talking about the providers themselves?

Dr. Conway: Yeah absolutely, and I think that what you are really talking about is the small part time practices. The providers are the ones responsible for their own behavior aren't they? The medical director is responsible for his own behavior, your rules certainly promote the development of addiction medicine groups and I think that is a very good thing and I think your rules clearly promote and protect public safety. And I think those aspects that protect public safety should be left entirely intact.

TDMHSAS Response: The Department acknowledges the comments submitted by Dr. Conway and would further state that these proposed rules have been developed in consultation with the Tennessee Department of Health in accordance with Chapter 912 of the Public Acts of 2016.

TIMOTHY S. SMYTH, M.D.: I echo everyone else in thanking you for all your hard work, especially you and Dr. Lloyd and the rest. Now I just wanted to emphasize a little more what a couple of people have addressed about not restricting access to care. [At this point in his oral comments, Dr. Smyth makes a comment about a specific provision of the proposed rules. The comment regarding that specific provision of the proposed rules is laid out and addressed later in this document under "Specific Comments".] The biggest reason for diversion is limited access to care and if they have to jump through too many hoops they will go back to the street and I see it a lot. I practice at Cherokee Hospital and they put their barrier up very high and the success rate, I hate to say it, the success rate of people staying in the program is exceedingly low. I just wanted to emphasize that.

TDMHSAS Response: The Department agrees and acknowledges that the dual goals of the proposed rules are to ensure effective, efficient, and safe delivery of office-based opiate treatment services while limiting the regulatory burden on licensed providers.

GREG KYSER, M.D., LEGISLATIVE REPRESENTATIVE, TENNESSEE PSYCHIATRIC ASSOCIATION: I am concerned with the direction that the state seems to be taking in this matter. The federal government is clearly encouraging additional providers to be involved in buprenorphine treatment and has increased caps on physician practices. However, the state seems to be pushing in the opposite direction. These new regulations, in all likelihood, will lead to fewer patients having access to treatment.

Given that the state has chosen to selectively enforce regulations regarding the receipt of treatment by TNCare patients from non-contracted doctors, there will be additional hardships on those patients that attempt to receive treatment in the open marketplace through their own means. If they are forced to pay physician fees, medication costs and counseling fees MAT may become cost prohibitive.

These additional costs will in all likelihood lead more doctors to prescribe generic buprenorphine pills, which can be more easily diverted and abused. There are also safety issues associated with this formulation.

It appears as though many of these regulations are being put into place to address issues related to non-physician ownership of for-profit clinics set up only to provide buprenorphine treatment. This form of treatment was initially set up to provide alternatives for patients who might not be comfortable for appropriate for other treatments such as methadone maintenance and to provide this treatment in a private practice setting. While I am in agreement with regulating large for profit clinics, many of these regulations may have the unwanted repercussions of limiting access to treatment in private practice psychiatric settings.

Several patients in my practice suffer from chronic pain and have found their way to buprenorphine treatment through a history of developing dependence on opiates. Many of these patients will be maintained chronically on buprenorphine, out of necessity of chronic pain in the context of a history of addiction issues. Many of these patients do not need the aggressive follow-up that will be mandated by these new regulations.

I am concerned that the above issues will lead to fewer patients benefiting from a proven and effective treatment and that the unintended consequence will be increased abuse of pharmaceutical opiates and heroin.

TDMHSAS Response: The Department acknowledges the comments received from Dr. Kyser but respectfully disagrees that more patients will increase abuse of opiates or heroin as a direct result of these proposed rules.

The proposed rules do not limit the number of patients a physician can treat using buprenorphine and therefore do not conflict with recent federal action that has increased the number of patients a physician can treat using buprenorphine to address opioid withdrawal.

The Department does share Dr. Kyser's desire that the focus of the proposed rules should be to ensure the effective, efficient, and safe delivery of office-based opiate treatment services while limiting the regulatory burden on licensed providers.

RODNEY A. POLING, M.D., DFAPA, PRESIDENT, TENNESSEE PSYCHIATRIC ASSOCIATION: In reading through the proposed rules, I agree with Dr. Kyser, in that the proposal does increase the bureaucratic burdens on an OBOT facility. However, it appears this proposal is specifically aimed at treatment facilities treating 150 or more buprenorphine patients or has greater than 50% of their patient population being treated for opiate dependence with buprenorphine. Specific practices or clinics specializing in these patients probably should have some extra oversight, however, it appears the state wants to regulate much the same as a Methadone Clinic is regulated.

The entire purpose of DATA 2000 was to avoid clinics like this and encourage PCP's, Psychiatrists and other physicians who find themselves treating patients with opiate addiction, to treat these patients on an outpatient basis and I can attest, in small numbers, the treatment can be quite successful. But, getting these patients to participate in counseling is almost impossible. [At this point in his written comments, Dr. Poling makes a comment about a specific provision of the proposed rules. The comment regarding that specific provision of the proposed rules is laid out and addressed later in this document under "Specific Comments"].

Though I understand the need for regulation, I would urge the state to encourage small practice, outpatient treatment per DATA 2000, not to discourage physicians with more bureaucracy. Buprenorphine is not Methadone, and the risk of abuse and diversion is much less.

TDMHSAS Response: The Department acknowledges the comments received from Dr. Poling. The Department agrees that these proposed rules are for facilities that meet the statutory definition of an OBOT facility pursuant to Chapter 912 of the Public Acts of 2016 and share Dr. Poling's desire that the focus of the proposed rules should be to ensure the effective, efficient, and safe delivery of office-based opiate treatment services while limiting the regulatory burden on licensed providers.

SPECIFIC COMMENTS

***All citations referenced by the stakeholders in this section refer to the version of the rule as it appeared in the Notice of Rulemaking Hearing document filed by TDMHSAS with the Secretary of State on July 8, 2016.*

0940-05-35-.02(2)(a)

JAMES MANUELE, M.D., FACOG: The final line, 'An association by contract... shall be considered an OBOT.' Extends the definition well past the legislative intent and surpasses the law resulting in the Department of Mental Health redefining any 2 doctors with DATA 2000 waivers operating in the same location as an OBOT; this was not what the Legislature intended when they passed the bill.

PAUL S. TRIVETTE, EXECUTIVE DIRECTOR, PATIENT ACCESS TO ADDICTION TREATMENT: *An association by contract, fee for service, business arrangement, or two or more unaffiliated physicians with a DATA 2000 waiver operating at the same physical location shall be considered an OBOT.*

This sentence leads a person to believe that if two or more unaffiliated physicians are working together at a physical location then that is considered an OBOT even if the patient total is less than 150. We recommend this sentence be removed as the statute covers the requirement for licensure as an OBOT.

TIMOTHY S. SMYTH, M.D.: How does the State justify defining a physician's practice according to the space he or she may rent in order to practice his/her profession? A physician renting space to practice medicine at a location where a separate physician sublets space on a different day, or same day, different suite - and these physicians have nothing to do with each other - should not constitute an OBOT. Many physicians will simply move to independent physical locations, thereby driving up their overhead, which, ultimately is passed on to their patients. Defining an OBOT based on patients seen under the same roof simply make landlords happy, as they will rent more spaces.

KEVIN CATNEY, M.D., DABFM, DABAM: This criteria no longer make sense in light of the federal government's decision in 42 CFR part 8 to raise the cap for a single provider to 275. A single solo practitioner at a single office location should not be considered a "treatment program."

Recommend that the rules be revised to reflect that a nonresidential office-based opiate treatment facility be defined as greater than 275 patients at a single geographical location. Traditionally many therapists and primary care doctors have engaged in 2 physician practices, in order to provide cross coverage for illness or for vacation, and in order to take advantage of sharing overhead costs. An OBOT as further described in these proposed regulations is strongly discriminatory against this type of small practice partnership.

These regulations encourage very large practices, capable of affording regulatory officers, case management staffs, information technology staffs, and numerous employees that will be required to be compliant with the minutia of this regulation. A small two physician partnership simply lacks that level of financial scale. Conversely however, a small practice allows office staff and physicians to be thoroughly familiar with every patient, and to deliver a level of personalization of care that exceeds the capability of a large health care system: they simply can't deliver the same level of customization of care, to meet the individual patient's needs.

There are pros and cons to both approaches to addiction treatment. The guidelines, which appear to have been lifted from a Community Health Care System Model, neglect the benefits of a small program.

Recommend that the rules be revised to include any location with more than two (2) physicians. But that two physician locations be excluded from the definition of an OBOT.

TDMHSAS Response: The last sentence of 0940-05-35-.02(2)(a) has been deleted.

The proposed rules do not limit the number of patients a physician can treat using buprenorphine and therefore do not conflict with recent federal action that has increased the number of patients a physician can treat using buprenorphine to address opioid use disorder.

0940-05-35-.02(2)(d)

WILLIAM "BILLY" MANLEY, FNP-BC: TDMHSAS needs reach out to CSMD program and have non prescribing licensed professional to be allowed to access. This allows counseling professionals to access and utilize.

TDMHSAS Response: The Department acknowledges and appreciates comments received from Mr. Manley. Concerns addressed in this comment will be referred to the Department of Health for their consideration.

0940-05-35-.02(2)(e)

KEVIN CATNEY, M.D., DABFM, DABAM: I do not believe that telehealth is quality care. I have personally seen this used in a psychiatric setting, and heard stories about it being used in an addiction setting. Patients have commented that they find it dehumanizing. They resent the loss of personal face to face contact with their physician or counselor. It creates an un-acceptable barrier to development of the therapeutic bond between patient and physician. In addition, in addiction medicine in particular, it is extremely important that the trained physician be able to examine the patient. I have heard stories of patients being asked to hold body parts up to the camera. I find this particularly unacceptable.

Recommend that physicians endeavor to see all of their patients be in person at least once per month, unless there are genuine extenuating circumstances that prohibit it. The convenience of seeing patients over a television monitor so that you don't have to have the inconvenience of a commute, is not an extenuating circumstance. We need to lay hands on our patients in order to deliver quality care.

DR. TOM REACH, PRESIDENT, WATAUGA RECOVERY CENTER, JOHNSON CITY: Leave this the way it is. The idea that 25,000 addicts in TN need of an hour of counseling twice a week is unnecessary and would not be feasible. Calculate the number of hours and counselors needed. More importantly, the vast majority of addicts in treatment do NOT need this level of intensive counseling... they need brief encounters, encouragement, educational groups, and twelve step meetings. True counseling is only effective if and when the patient is ready. It should be available, but not mandated by the state.

CEDAR RECOVERY CENTER OF MIDDLE TENNESSEE: (e) "Counseling" or "Counseling Session" means a face-to-face individual therapeutic counseling session lasting not less than twenty (20) minutes with a qualified provider, or a group educational session of no more than twenty (20) patients and lasting not less than fifty (50) minutes facilitated by a qualified provider. Counseling shall be focused on issues related to the patient's opioid use disorder and shall not include discussions related to administrative procedures. Telehealth, pursuant to the Tennessee Code Annotated, may be utilized to facilitate counseling. Attendance of a 12-step program, such as Narcotics Anonymous, shall not be considered counseling. The Facility shall document each counseling session in the patient's medical chart.

We ask the word "or" is replaced with the word "and".

Asking an OBOT to require group sessions is not a challenging task. If the physician does not want to require group they can only see 149 patients. A group counselor is inexpensive and can change the life of patients.

ALEXANDER ZOTOS, M.D. FASAM, PRESIDENT, TENNESSEE SOCIETY OF ADDICTION MEDICINE: The counseling sessions should be somewhat more flexible and include a clause for board certified physicians or qualified physicians [who] do not require the specific time limit requirements.

WILLIAM "BILLY" MANLEY, FNP-BC: Counseling is an organic process that needs to be lengthened or shortened based on individual needs. Placing time constraints in the definitions doesn't allow for practicality/reality of what happens when working with the addiction population ie group numbers and issues of present group members dictate length in my office. They range from 25min to 1.5 hours

MARY LINDEN SALTER, L.C.S.W., TAADAS: Additionally, we are concerned with the definition of "Counseling" [0940-05-35-.02(2)(e)] and its implementation [0940-05-35-.09(4)(a) and (b)]. Cognitive Behavioral Therapy (CBT) is one evidence based practice for use with addiction counseling and it the basis of many other forms of therapy. While CBT protocols can utilize short, time limited counseling sessions, most evidence-based programs are premised on sessions lasting 50 minutes and most are from 12-20 weekly sessions, for an average of 14 weekly sessions. If the sessions are short and do not occur weekly, the number is increased. These rules allow for 20 minute individual sessions which cannot be used to sustain meaningful change if there are only two sessions the first month (induction) and then one session a month thereafter (maintenance). These standards do not promote the therapeutic time needed to implement an appropriate treatment protocol. We encourage TDMHSAS to revise the rules to require at a minimum, 50 minute individual sessions at no less than 2 week intervals for any stage of treatment at this level of care and would encourage that caseloads be limited to 50 individual clients per clinician (not including group work with additional clients). The definition of Qualified Provider [0940-05-35-.02(2)(y)] should include: LAADAC II; LAADAC I (under direct supervision of QCS); Psychologist; Psychiatrist/Addictionologist/M.D.; LPC, L.C.S.W., LMFT (with MAC or under direct supervision of QCS).

TDMHSAS Response: The Department acknowledges comments received regarding 0940-5-35-.02(2)(d). The proposed rules establish minimum standards regarding counseling and encourage all facilities to individualize counseling for each patient which may include sessions occurring more frequently than set by these minimum requirements.

0940-05-35-.02(2)(j)

PAUL S. TRIVETTE, EXECUTIVE DIRECTOR, PATIENT ACCESS TO ADDICTION TREATMENT: The responsibilities for a 'Facility Director' mimics that of the 'Medical Director' portion. The 'Facility Director' should not be responsible for practitioners unless he/she is a physician.

WILLIAM "BILLY" MANLEY, FNP-BC: The idea of removing practitioners from the list of person overseen by the facility director was mentioned in the meeting. Within any environment there are directors who oversee

compliance of prescriber who do not have the education of the prescribers but are acutely aware of practice standard in order to meet facility compliance. Therefore I see no need to change the wording.

* With the passing of the CARA act multiple provider will now be available to apply for x-waivers. Are you including verbiage in these rules that is generic is prescriber or provider not M.D. to prepare for those changes?

TDMHSAS Response: The Department agrees with comments received regarding the facility director's responsibility to oversee the Facility's medical staff. The Department will revise the definition for facility director to clarify that a non-physician facility director shall not supervise medical staff.

In regards to non-physician DATA-waived practitioners, changes to rule and statute that cannot be accomplished under the promulgation of the proposed rules would be required to allow non-physicians to prescribe buprenorphine for an opioid use disorder, including TCA 53-11-311.

0940-05-35-.02(2)(m)

JAMES MANUELE, M.D., FACOG: An inspection should be just that, a physical inspection. This definition is so broad it allows the Board to do whatever it wishes under the guise of performing an inspection. Who will perform the inspection? Is an LPN employed by the Department of Mental Health qualified to tell Physicians how to practice or evaluate MEDICAL treatment? I think not.

ADAM NICKAS, CAPITOL RESOURCES, LLC: How will the Department identify a frivolous and/or recurring complaint that does not constitute an investigation because such a complaint was previously proven to have no merit by the Department? Additionally, when inspections are made, to what extent will the Department perform an examination of a provider "including, but not limited to, the premises, staff, persons in care..."? Our concern is that such an investigation is not overly-invasive to where it interferes with the practice of medicine and doesn't compromise the privacy of patients.

TDMHSAS Response: The Department will determine which complaints require an investigation on a case-by-case basis. Not every complaint results in an investigation. The Department will consult with qualified professionals when conducting an investigation as needed.

0940-05-35-.02(2)(n)

TENNESSEE DEPARTMENT OF HEALTH (TDOH): Consider adding the phrase, "Medical Director" means a physician with an unrestricted license licensed by the...

TDMHSAS Response: The Department acknowledges the comments received regarding 0940-05-35-.02(2)(n) and agrees to revise this definition.

0940-05-35-.02(2)(q)

TDOH: Consider removing the phrase, "who assess patient progress" as this could limit the definition of Multidisciplinary Treatment Teams to only the assessment of patients. Phrasing should be more inclusive to read "who assess, evaluate or treat a patient."

WILLIAM "BILLY" MANLEY, FNP-BC: The addition of NP's needs to be here as well as CNS these can be under the umbrella of Advanced practice Nurse.

TDMHSAS Response: The Department concurs with comments received from TDOH and will revise 0940-05-35-.02(2)(q) as suggested.

As to Mr. Manley's comment, the Department's intent was that the term "licensed nurse" includes advanced practice nurses, registered nurses, and licensed practical nurses.

0940-05-35-.02(2)(t)

PAUL S. TRIVETTE, EXECUTIVE DIRECTOR, PATIENT ACCESS TO ADDICTION TREATMENT: In many instances, facilities contract with labs to provide lab testing services. In these circumstances, the lab testing company may provide a full/part time employee to collect and process the urine specimens. The language and text needs to include "Conducted by and in the presence of a facility staff person or employee of a contracted lab so as to ensure against tampering..."

TDMHSAS Response: The Department concurs that further clarification regarding who performs the observed drug screen is needed and 0940-05-35-.02(2)(t) has been revised accordingly.

0940-05-35-.02(2)(v)

JAMES MANUELE, M.D., FACOG: Physical location: This is too broad. If any prescriber treats any patient for withdrawal with any controlled substance they run the risk of being considered an OBOT by the Department of Mental Health. Examples could be treating a single patient in an outpatient clinic or office before they are admitted to a rehab program or treating an infant in withdrawal. This single definition has the potential to keep providers of all specialties from treating withdrawal in so many settings. These rules were to be created to address opiate withdrawal and buprenorphine clinics. This single paragraph greatly expands the power of the Board over ANY clinic treating ANY withdrawal.

KEVIN CATNEY, M.D., DABFM, DABAM: The definition is unclear. Would completely unrelated practices that are in the same office building/complex be considered at the same physical location? This does not work, because it makes an individual provider responsible for guessing what is being done at completely unaffiliated practices in the same office building/complex. This needs clarification. Different office suites in the same building have different mailing addresses, and therefore should not be considered the same geographical location.

TDMHSAS Response: 0940-05-35-.02(2)(v) mirrors the definition of “physical location” found in Chapter 912 of the Public Acts of 2016.

0940-05-35-.02(2)(w)

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: While conceptually attractive, phases of treatment is a paradigm which is often difficult to apply due to being over simplistic. This paradigm of treatment is analogous to many conceptual paradigms describing the natural course of illness or treatment in chronic illnesses.

Using this framework to mandate frequency of services, as is done later in this document, is problematic. “Phases of treatment” is a conceptual guideline, not a prescription for state regulation.

Recommendation: Understand that “phases of treatment” is a conceptual tool only, not a prescriptive tool.

TDMHSAS Response: The Department acknowledges Dr. Conway’s comment regarding phases of treatment. Utilization of a phases of treatment model, according to SAMHSA’s TIP 40, is a preferred method of tracking a patient’s progress throughout treatment.

0940-05-35-.02(2)(x)

TIMOTHY S. SMYTH, M.D.: Some facilities do not contract or hire physicians to provide medical services; rather, the individual physicians contract with the management group to provide back office services.

TDMHSAS Response: The Department concurs and has revised 0940-05-35-.02(2)(x) to mean any physician, including the medical director, who provides medical services to patients at the Facility.

0940-05-35-.02(2)(y)

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: (20) “Qualified mental health professional” means a person who is licensed in the state, if required for the profession, and who is a psychiatrist; physician with expertise in psychiatry as determined by training, education, or experience; psychologist with health service provider designation; psychological examiner or senior psychological examiner; licensed master’s social worker with two (2) years of mental health experience or licensed clinical social worker; marital and family therapist; nurse with a master’s degree in nursing who functions as a psychiatric nurse; professional counselor; or if the person is providing service to service recipients who are children, any of the above educational credentials plus mental health experience with children.

The above definition was copied from the Code. This definition is lengthy, ambiguous, often overly generous, and often unnecessarily restrictive.

Recommendation: The language would be clearer if a qualified mental health professional, for the purposes of qualification as a counselor in a physician practice devoted to opioid addiction, as

1. MSW licensed in Tennessee
2. Psychiatric Nurse licensed in TN
3. Drug and Alcohol Counselor licensed in Tennessee
4. Psychologist Licensed in Tennessee

I qualify this recommendation because I am not familiar with the nuances of credentialing of counselors in Tennessee.

ADAM NICKAS, CAPITOL RESOURCES, LLC: Is it the Department's intent that a "Qualified Provider" may satisfy only one of the three qualifiers as outlined in the definition? We are seeking clarification that a "Qualified Provider" can be a "qualified mental health professional" OR "qualified alcohol and drug abuse treatment personnel."

CEDAR RECOVERY CENTER OF MIDDLE TENNESSEE: "Qualified Provider" means a qualified mental health professional as defined in T.C.A. 33-1 -101(20), qualified alcohol and drug abuse treatment professionals defined in 0940- 05-01-. 16(7), or treatment staff operating under the direct supervision of either a qualified mental health professional or qualified alcohol and drug abuse treatment personnel.

0940-05-01-. 16(7) States the following:

"Qualified Alcohol and Drug Abuse Treatment Personnel" means persons who meet the criteria described in subparagraphs (a), (b) and (c) as follows:

(a) Currently meet one (1) of the following conditions:

1. Licensed or certified by the State of Tennessee as a physician, registered nurse, practical nurse, psychologist, psychological examiner, social worker, substance abuse counselor, teacher, professional counselor, associate counselor or marital and family therapist, or if there is no applicable licensure or certification by the State, has a bachelor's degree or above in a behavioral science or human development related area; or
2. Actively engaged in a recognized course of study or other formal process for meeting criteria of part (1) of subparagraph (a) above, and directly supervised by a staff person who meets criteria in part (1) of subparagraph (a) above, who is trained and qualified as described in subparagraph (b) and (c) below, and who has a minimum of two (2) years experience in his/her area of practice; and (b) Are qualified by education and/or experience for the specific duties of their position; and (c) Are trained in alcohol, tobacco and/or other drug abuse specific information or skills. (Examples of types of training include, but are not limited to, alcohol or other drug abuse specific in-services, workshops, substance abuse schools, academic coursework and internships, field placement or residences).

OUR REQUEST CONCERNING 0940-05-01-. 16(7)

We ask that you remove 0940-05-01-. 16(7)

0940-05-01-. 16(7) allows nearly anyone to provide counseling to patients (example -a teacher can be the counselor?)

This measure will allow physicians to be the only "counselor" in an OBOT. If the physician does not want to provide counseling (besides from the physician) our recommendation is they should limit their practice to 149 patients.

The OBOT License should be different than physicians wanting to do this as part of their practice or part time. An OBOT should be a team of physicians, counselors, and / or social workers working together to help each patient - not a one off physician...they can do this and see less than 150 patients.

Otherwise...there is not an increase in care from a non-licensed facility to a licensed facility.

MARY LINDEN SALTER, L.C.S.W., TAADAS: The definition of Qualified Provider [0940-05-35-.02(2)(y)] should include: LAADAC II; LAADAC I (under direct supervision of QCS); Psychologist; Psychiatrist/Addictionologist/M.D.; LPC, L.C.S.W., LMFT (with MAC or under direct supervision of QCS).

MICHAEL TINO, M.D., FASAM, DABAM, DOCTORS ASSISTED WELLNESS & RECOVERY CENTER, LLC: Certified Peer Recovery Specialists. Please include these individuals as qualified counselor by training as they are certified by the State of TN and Addiction experience in lieu of education.

TDMHSAS Response: The Department intends that a qualified mental health provider OR a qualified alcohol and drug abuse treatment personnel OR treatment staff operating under the direct supervision of either a qualified mental health professional or qualified alcohol and drug abuse treatment personnel would qualify as a “qualified provider” under the proposed rules.

As for the comment regarding changing the statutory definition of “qualified mental health professional” and the rule-based definition of “qualified alcohol and drug abuse treatment personnel”, the scope of the proposed rules is limited to 0940-05-35 and does not extend to other proposed statutory or rule changes.

It is the Department’s position that the definition of “qualified mental health professionals” and “qualified alcohol and drug abuse treatment personnel” include professional individuals listed in the comments received from Dr. Conway and Ms. Salter with TAADAS.

Although certified peer recovery specialists are a valuable resource for individuals in recovery, they are not qualified or trained to provide counseling services.

0940-05-35-.02(2)(z)

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: One illicit positive drug screen, by itself, does not define a relapse. One illicit drug screen, fully confirmed, and by itself, is more consistent with a slip.

Relapse, as commonly used in medicine, refers a longer duration with a significant failure. For example, in diabetes mellitus, relapse would be used for an insulin dependent patient who, in previous good control, experienced a hospitalization for hyperosmolar coma or for ketoacidosis. In opioid addiction, relapse would be more appropriate for a patient in remission who began using heroin again.

This distinction is crucial for its implications for treatment.

Recommendation: Delete Relapse entirely, or make a new definition. Change the current definition of relapse to Slip.

TIMOTHY S. SMYTH, M.D.: If a patient states he or she has relapsed, said admission must be verified by a drug screen. This is nonsensical and only adds to the cost of delivering care.

TDMHSAS Response: The Department concurs and has revised 0940-05-35-.02(2)(z) to be more consistent with the definition of “relapse” published by the American Society of Addiction Medicine.

0940-05-35-.02(2)(bb)

TIMOTHY S. SMYTH, M.D.: An individual who takes his or her medication, a buprenorphine containing medication, and otherwise lives a “normal” life may not need all of these “wrap around services”. These services may, in fact, be a burden for the individual and/or the family. How do these rules accommodate this patient?

TDMHSAS Response: The Department concurs and has revised 0940-05-35-.02(2)(bb) accordingly.

0940-05-35-.02(2)(dd)

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: Opioid Dependence means a chronic metabolic illness whose effective treatment places the disease in remission. Failure to place the disease in remission has the following potential complications:

- a. Premature death
- b. Premature shortening of life from acceleration of the medical complications of opioid dependence

- c. Premature disability from the primary disease process or its complications
- d. Impairment in judgment
- e. Incarceration
- f. Impairment or failure to work
- g. Harm to family or community
- h. Harm to fetus if pregnant

TDMHSAS Response: A definition of “alcohol and/or drug abuse or dependency”, which is similar to Dr. Conway’s suggested defined term “opioid dependence”, currently exists in 0940-05-01-.16(2).

0940-05-35-.02(2)(ee)

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: Epidemic in Opioid Dependence means an increasing frequency of illicit opioids, with shifting predominance to heroin, with accelerating negative impact upon patients, community, healthcare cost, and incarceration.

TDMHSAS Response: The Department recognizes the dangers of an “epidemic in opioid dependence” but does not believe that this term needs to be defined in the proposed rules.

0940-05-35-.02(2)(ff)

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: Buprenorphine maintenance treatment refers to a major treatment of opioid dependence.

TDMHSAS Response: A definition for “medication assisted treatment”, which is similar to Dr. Conway’s suggested defined term “buprenorphine maintenance treatment”, currently exists in 0940-05-35-.02(2)(p).

0940-05-35-.03(1)(a)-(c)

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: I have having difficulty finding these rules.

TDMHSAS Response: The rules listed in 0940-05-35-.03(1)(a)-(c) can be found at: <http://share.tn.gov/sos/rules/0940/0940-05/0940-05.htm>.

0940-05-35-.04(2)

WES WEIGEL, YOST ROBERTSON NOWAK PLLC, WILLIAMSON COUNTY ESCROW & TITLE, INC.: Under current regulations, are there any requirements that clinics be owned in part by Dr.'s?

JAMES MANUELE, M.D., FACOG: Here the Department of Mental Health is defining a business organization at its “sole discretion”. I thought the Secretary of State and the Attorney General had these powers. Why and how can the Department of Mental Health legally grant themselves this power? There is no due process! Instead one is left with a decree for the Department of Mental Health.

TDOH: Consider moving the definition for “Ownership structure” to the definition section to assist with ease of reading rules.

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: The last sentence is well written, and allows protection of public safety.

PAUL S. TRIVETTE, EXECUTIVE DIRECTOR, PATIENT ACCESS TO ADDICTION TREATMENT: Please include language indicating that all OBOTs shall adhere to statutes regarding the corporate practice of medicine. Please also include language that all OBOTs shall be owned by at least one licensed physician.

DR. TOM REACH, PRESIDENT, WATAUGA RECOVERY CENTER, JOHNSON CITY: DATA 2000 waivers are national. In order to write a scheduled substance, a separate DEA registration is required for each state in which the doctor has a license, but the /data 2000 applies to all states.

TDMHSAS Response: The proposed rules create a new licensure category known as minimum program requirements for nonresidential office-based opiate treatment facility. There are no current state rules or regulations regarding office-based opiate treatment facilities to which to compare these proposed rules.

Under current law (See T.C.A. 53-11-311(c)(1)), only physicians with a DATA 2000 waiver can prescribe buprenorphine to treat opioid use disorder. Therefore the Department believes that in order to ensure quality opioid use disorder treatment at an OBOT, an OBOT's ownership structure should incorporate a physician who possesses a DATA 2000 waiver.

The Department believes that ownership requirements are best left under the "Licensing Procedures" section.

Per 0940-05-06-.01(1), all TDMHSAS licensees are required to comply with all local, state, and federal ordinances, rules, regulations, and laws, including those related to the corporate practice of medicine.

The Department has removed unclear language regarding the registry of the DATA 2000 waiver in Tennessee.

0940-05-35-.04(5)(a)(3.)

JAMES MANUELE, M.D., FACOG: Why does a Department of Mental Health need a 'Financial Statement'? Mental Health and accounting are not synonymous. What does a Financial Statement have to do with an application or opioid treatment?

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: There is no Board of Medical Examiners in the United States which requires a financial statement for licensure. For licensure, there is no obvious public good which is benefited by disclosure of financial statement.

Prescribing buprenorphine, either in solo, or in an addiction medicine group is a low volume and low revenue practice. Done properly, it is low profit.

Recommendation: Drop the requirement for financial statements.

TDMHSAS Response: The Department respectfully disagrees. The policy reason for requiring a financial statement as part of the application for licensure is to ensure continuity of treatment for patients.

The Department believes it is important to safeguard against a scenario wherein a Facility is unable to offer services on a consistent basis due to lack of economic stability.

0940-05-35-.04(5)(c)-(d)

TIMOTHY S. SMYTH, M.D.: Do these rules apply to a physical location that provides managerial services to physicians, but does not employ or contract with those physicians to provide medical services? The physicians contract with the management company to provide office staff services.

TDMHSAS Response: The person/entity providing services that qualify as an OBOT is the person/entity who is subject to the proposed rules.

The Department recognizes that each licensee will deal with unique issues and TDMHSAS licensure staff is available to answer specific questions and provide technical assistance regarding all licensure issues on a case by case basis.

0940-05-35-.04(5)(c)

KAREN PERSHING, MPH, CPS II, EXECUTIVE DIRECTOR, METRO DRUG COALITION: Should we add "with an unencumbered Tennessee medical license"?

TDMHSAS Response: The Department has revised this provision so as to require evidence of a contracted and/or currently employed physician with a DATA 2000 waiver, who possesses an unrestricted

Tennessee license to practice medicine or osteopathy at the time of application.

The Department believes that OBOT patients can benefit from the care of physicians who have had issues with substance abuse and the proposed rules allow physicians in recovery and who are working with the Board of Medical Examiners and treatment assistance entities, such as the Tennessee Medical Foundation, to continue to serve their patients and even serve as the medical director of an OBOT if their license to practice medicine or osteopathy is unrestricted.

0940-05-35-.04(5)(f)

JAMES MANUELE, M.D., FACOG: This phrase is so broad it's unenforceable, and unconstitutional.

ADAM NICKAS, CAPITOL RESOURCES, LLC: The statement "Any other item the Department believes is necessary and proper for application purposes" is very open-ended. While we understand the Department's rationale of not being confined to only requesting items outlined in this Rule, our hope is that this provision can be re-worded to limit the uncertainty it creates among providers.

TDMHSAS Response: The Department respectfully disagrees and no change to this provision will be made. This provision is comparable to a currently effective administrative rule (0940-05-02-.04(f)).

0940-05-35-.04(6)

TDOH: Consider applying this provision to both new and renewal applications.

TDMHSAS Response: The Department acknowledges the issue as stated by the Department of Health but the Department recognizes that this is a new licensure category meant to set up minimum program requirements for facilities who are currently providing these services and this provision is intended to ensure continuity of those services at these facilities. This provision is consistent with the application procedures for other TDMHSAS licensure categories.

0940-05-35-.04(7)

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: This statement is well written. The fundamental power to protect public safety comes from forwarding complaints to Board of Medical Examiners. This is the most fundamental rule of the statute. If a surveyor or supervisor of TDMHSAS perceives substandard quality, then a referral to the Board of Medical Examiners is certainly appropriate.

TDMHSAS Response: The Department agrees.

0940-05-35-.04(8)

JAMES MANUELE, M.D., FACOG: The purpose of an inspection is to evaluate compliance, not fault finding. It is too broad and ill defined. Furthermore, this violates the 4th Amendment of the Constitution!

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: This statement is well written. The fundamental power to protect public safety comes from wise and prudent use of this right.

PAUL S. TRIVETTE, EXECUTIVE DIRECTOR, PATIENT ACCESS TO ADDICTION TREATMENT: What type of 'third parties?' What would this include?

ADAM NICKAS, CAPITOL RESOURCES, LLC: What are defined as "reasonable requests?" Is it the same as what is defined in (9) (a) for inspections of unlicensed facilities? Additionally, what "third parties" will information potentially be gathered from?

TDMHSAS Response: This provision is consistent with the licensure procedures for other TDMHSAS licensure categories and speaks to the Department's ability to receive complaints regarding a licensed provider.

Examples of third parties may include the general public and other state and federal regulatory agencies.

0940-05-35-.04(8) addresses licensed facilities and 0940-05-35-.04(9)(a) addresses unlicensed facilities and the term "reasonable request" is used differently in 0940-05-35-.04(8) than the term

“reasonable amount of information” is used in 0940-05-35-.04(9)(a). A “reasonable request” as used in 0940-05-35-.04(8) is any request for information that the licensee is able to produce that is within the scope of the inspection or investigation by the Department.

0940-05-35-.04(9)

JAMES MANUELE, M.D., FACOG: Again, the Department is granting itself the ability to ignore due process and the law. Our police have less power! This is too broad, usurps our laws, and ignores the rights of the patients and providers.

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: This statement is well written. The fundamental power to protect public safety comes from wise and prudent use of this right.

TDMHSAS Response: The Department has the statutory authority to ensure that effective, efficient, and safe substance abuse treatment options are provided in Tennessee. Please see 33-2-401 et. seq.

0940-05-35-.04(9)(a)(1.)

JAMES MANUELE, M.D., FACOG: Allowing the Department access to records places the Facility at risk of violating confidentiality as defined in several Federal and State statutes.

TDMHSAS Response: The Department respectfully disagrees. The Department conducts inspections and investigations in full compliance with state and federal confidentiality laws.

0940-05-35-.04(9)(a)(2.)

JAMES MANUELE, M.D., FACOG: Is the Department charged with Mental Health or the Practice of Medicine? It seems here the Department wants to do both.

TDMHSAS Response: The Department’s goal with this provision is to ensure the provider meets the licensure threshold for this licensure category.

0940-05-35-.06

KEVIN CATNEY, M.D., DABFM, DABAM: Much of this section appears to be directed at large multi physician practices, such as a Community Health Center Model of Care, or even structured for large facilities that might include inpatient sectors, intensive outpatient programs, and finally office based follow up care. This section completely neglects the way that a small private practice operates. The terminology is completely different. In a private practice, we see a patient for an initial consultation, not for “intake,” for instance, and we arrange for a follow up appointment with the patient, not an “aftercare plan.” I’d ask any reader of this comment to consider if these terminology apply to the interactions that they have with their own personal physician, and I’d wager that they don’t.

The problem with this section of the regulations is that they are trying to apply work flow and models of patient care used by large federally subsidized multispecialty practices and institutions, to small solo and 2 physician practices. The same regulatory guidelines are simply an unnatural fit. The answer is to create a different regulation for small practices, and to exempt them from the OBOT regulations. Raising the definition of an OBOT to greater than 275 would effectively solve the solo practitioner problem, and bring these regulations into alignment with the federal law as it now exists. I would also urge that 2 physician partnerships also be exempted from these regulations, as this arrangement allows for greater economies of scale, and more ancillary staff to be hired to provide case management and counseling in office, and perhaps make it possible to accept more insurance for office visits.

TDMHSAS Response: Public Chapter 912 of 2016 statutorily defines an OBOT as an entity “prescribing products containing buprenorphine...to fifty percent (50%) or more of its patients and one hundred fifty (150) or more patients.” The proposed rules define office-based opiate treatment facilities using the statutory definition of an OBOT as determined by the Tennessee General Assembly.

0940-05-35-.06(1)

WILLIAM "BILLY" MANLEY, FNP-BC: At an office a patient calls and makes an appointment to be seen and discusses their needs with the office staff. If they appear to be requesting services provided by the facility, an appointment is made. The providers are then asked to do a full assessment determining if the patient is truly appropriate for the care they are licensed and trained to provide. This is standard and ethical practice throughout the medical field. NPs see pcp clients and they refer to a physician when the complexity exceeds their training. I'm not sure how this requirement fits into this model. This is the type of assessment done to pre-cert a patient for a mental health facility such as in - patient rehab or IOP. This seems inappropriate for an OBOT. This also seems time consuming and not necessarily billable thus increasing the costs to run the facility thus making OBOTs more expensive and less accessible to the people of TN.

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: This is very long and wordy.

Recommendation: Delete the current content and consider using the following language to simplify:

Opioid Dependence is a serious, chronic illness which is treated by serious long term treatments. Prior to beginning treatment with buprenorphine, the physician should be certain that the patient meets DSM criterion for opioid dependence, and that buprenorphine is medically necessary. Prior to beginning treatment, the physician should determine that this patient can be and should be treated in this facility.

PAUL S. TRIVETTE, EXECUTIVE DIRECTOR, PATIENT ACCESS TO ADDICTION TREATMENT: This may create difficulty as the medical director may not be present at the facility. The current rule regarding medical directors, which we believe needs to be re-evaluated, allows for physicians to be the medical director at more than one facility. The words "Prior to admission" needs to be changed to "Upon admission." We recommend the text read as follows, "Upon admission to the facility, a program physician and/or clinical staff, who have been determined to be qualified..."

TIMOTHY S. SMYTH, M.D.: What constitutes "admission to the Facility":

- Having an appointment?
- Beginning of appointment – on first face to face contact with a provider?
- At the conclusion of the first evaluation and decision to treat patient?

DR. TOM REACH, PRESIDENT, WATAUGA RECOVERY CENTER, JOHNSON CITY: I still don't like the phrase "admission to the Facility". As a doctor's office, we are "accepting patients into the practice". This can be easily fixed by making the first line read... "During the initial visit to the OBOT program...."

ADAM NICKAS, CAPITOL RESOURCES, LLC: What is the Department's definition of "admission?" Does it refer to a first-time patient or each visit by a patient? Does the Department consider the terms "prior to admission" and "prior to receiving treatment" interchangeable? We want to ensure we understand what is required of a provider prior to "admission" and prior to "treatment" in the appropriate order.

TDMHSAS Response: The Department believes that the current language of 0940-05-35-.06(1) is clear.

The term "admission" refers to the scenario where an OBOT has evaluated the prospective patient and has made a decision to treat that patient.

Furthermore, 0940-05-35-.06(1) allows for the medical director OR a program physician, with the assistance from appropriate clinical staff, to perform or coordinate assessments.

0940-05-35-.06(1)(a)

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: This statement is far too prescriptive and controlling. Getting administrative approval from the Department for the design of the "work-up" is clear administrative over reach which has no real pay-off for protection of public safety.

For example, in our group, in our initial work-up, we use the following instruments:

1. Addiction Severity Index, since this is the gold standard commonly used across the discipline.
2. Quick Inventory for Depression, the classic instrument used by the psychiatrists in STAR-D for the evaluation of treatment efficacy of various antidepressant regimens.
3. GAD-7 for anxiety, which was recommended by the psychopharmacology faculty at Massachusetts

General Hospital.

4. Columbia Suicide Scale, which was recommended at a Harvard Course.

For our longitudinal work, we use the SF-36, a well-recognized tool used across Psychiatry with multiple research advantages.

Recommendation: Delete the entire content of section (a) and replace with the following:

(a) The facility will administer the Addiction Severity Index at admission to the facility. The further evaluation of the patient may include professional assessment tools with professional merit.

TIMOTHY S. SMYTH, M.D.: Is the University of Vermont Treatment Needs Questionnaire adequate? This is a treatment needs questionnaire based on the ASI.

TDMHSAS Response: The Department agrees with the premise behind Dr. Conway's comment and has made a change to 0940-05-35-.06(1)(a) to reflect that peer reviewed and validated assessment and evaluation tools as well as those assessment and evaluation tools approved by the Department can be used to complete assessments and/or evaluations.

The University of Vermont Treatment Needs Questionnaire meets the requirements of the proposed rules.

0940-05-35-.06(2)(a)-(f)

JAMES MANUELE, M.D., FACOG: While this sounds great on paper, anyone thinking a patient in withdrawal is going to read, comprehend, or retain any of this info is laughable. It may make one feel good, but it does nothing to improve care BEFORE treatment starts. The amount of info required in this paragraph alone well exceeds that found in most home or car purchases! Yet the Department thinks we should require patients in withdrawal having received this education. Effort would be better served having the Department and the Board of Medicine create a booklet/small novel available for free to all patients those addicted and those not (think prevention, here).

WILLIAM "BILLY" MANLEY, FNP-BC: Will the state be providing appropriate and approved literature to download and print to provide patients for these requirements or list of approved sources to gather information for written information. Remember we are talking about smaller situation not large entities or government sponsored facilities.

TDMHSAS Response: The Department's licensure office is available to provide technical assistance regarding any provision of the proposed rules.

0940-05-35-.06(2)(b)

PAUL S. TRIVETTE, EXECUTIVE DIRECTOR, PATIENT ACCESS TO ADDICTION TREATMENT: It may be prudent that the facility should offer resources and information regarding VLARC.

TDMHSAS Response: The Department concurs and has made changes to 0940-05-35-.10(1) that address this comment.

0940-05-35-.06(3)

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: Language is clear and straightforward in (3).

TDMHSAS Response: The Department agrees.

0940-05-35-.06(4)

JAMES MANUELE, M.D., FACOG: It's a great goal to try to move pregnant addicted mothers to the head of the line. How is an OBOT to determine, over the phone, when a patient calls to schedule an appointment, "that the health of the mother and/or unborn child is more endangered than is the health of other patients"? What if a female patient represents herself as pregnant, is moved ahead of someone else and turns out not to be pregnant or miscarries? One should realize that a woman post miscarriage or delivery will urine test positive for weeks to months after the event. Having this requirement codified is asking for trouble as written.

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: Language is clear and straightforward in (4). If mother and/or unborn child are to be protected, then the priority should be clear. However, if the treatment of mother and unborn child is first priority, make it first priority.

Recommendation: Delete the following clause: and it is determined that the health of the mother and/or unborn child is more endangered than is the health of other patients waiting for services.

KAREN PERSHING, MPH, CPS II, EXECUTIVE DIRECTOR, METRO DRUG COALITION: I would delete the text after "waiting list for admissions." Aren't they required by law to move pregnant women up in front of waiting lists or is that just for state-funded programs?

TDMHSAS Response: The Department acknowledges these comments and has made appropriate changes to 0940-05-35-.06(4).

0940-05-35-.06(5)

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: Language is clear and straightforward in (5).

TDMHSAS Response: The Department agrees.

0940-05-35-.06(7)

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: Language is clear and straightforward in (7).

KAREN PERSHING, MPH, CPS II, EXECUTIVE DIRECTOR, METRO DRUG COALITION: Under comprehensive assessment, there is nothing stated about doing a trauma assessment. This is important, especially for female patients. This has been the push from SAMHSA for the last several years to provide "trauma-informed" treatment services.

TDMHSAS Response: The Department agrees that the language of this provision is clear and straightforward and does not believe a change is appropriate.

Under the proposed rules, the comprehensive assessment must be completed in accordance with peer reviewed medication assisted treatment guidelines and "trauma-informed" treatment services will likely be addressed under those guidelines (See SAMHSA's TIP 40).

0940-05-35-.06(8)

PAUL S. TRIVETTE, EXECUTIVE DIRECTOR, PATIENT ACCESS TO ADDICTION TREATMENT: Will there be a protocol for patients, who fail to continue in treatment such as failing to show for an appointment or call? At what point is the patient considered discharged? We recommend that be the facility's discretion.

ADAM NICKAS, CAPITOL RESOURCES, LLC: What is the Department's definition of "discharge?" Does it refer to a referral, end of each visit, the termination of a patient's future visits?

TDMHSAS Response: The term "discharge" refers to a scenario in which a patient will no longer receive OBOT services at the Facility.

0940-05-35-.06(8)(b)

DR. TOM REACH, PRESIDENT, WATAUGA RECOVERY CENTER, JOHNSON CITY: Discharge and /aftercare plans. This entire section was borrowed from inpatient addiction treatment, IOP's and the methadone programs. None of it really applies to an OBOT. Patients leave for days or weeks ALL THE TIME, and then return for care. I believe this entire section only applies to the small minority of patients who completely wean from MAT and successfully enter an abstinence based program.

It is a huge administrative burden that will in no way improve the quality of care for the patient... hence it will take time and money away from effective patient care measures.

I recommend eliminating it completely.

TDMHSAS Response: The Department respectfully disagrees. The new 0940-05-35-.06(7) clearly states that it only applies to "patients who complete their course of treatment." An individualized discharge and aftercare plan only has to be prepared for those qualifying individuals and not for every OBOT patient. This provision does not apply to patients who have been absent from the Facility.

0940-05-35-.06(8)(c)

TDOH: Consider the timing of the discharge plan. Department of Health would have concerns about patients being discharged in some instance without a plan being in place. We recommend completion of the plan prior to discharge.

TDMHSAS Response: The Department agrees and has made the change to the new 0940-05-35-.06(7)(c) recommended by TDOH.

0940-05-35-.06(9)

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: Language is clear and straightforward in (9).

TDMHSAS Response: The Department acknowledges this comment.

0940-05-35-.07(1)

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: Minimum requirements of Chapter 0940-05-06: What is this?

TDMHSAS Response: Tennessee Rules Chapter 0940-05-06 contains the Department's minimum program requirements for all services and facilities licensed by TDMHSAS. These rules can be found at: <http://share.tn.gov/sos/rules/0940/0940-05/0940-05.htm>.

0940-05-35-.07(2)(a)

MITCHELL MUTTER, M.D., TENNESSEE DEPARTMENT OF HEALTH: Request for records in any event should be 10 business days to be consistent with T.C.A. § 63-2-101(a)(1).

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: Section 2(a) is in clear conflict with the standard requirements for closing a medical practice from the Board of Medical Examiners.

Recommendation: Delete the above in (2) a. Substitute with following language:
In the event of closure, the licensee should follow standard rules from the Board of Medical Examiners for closing a practice.

TDMHSAS Response: The Department agrees and has made changes to 0940-05-35-.07(2)(a) in order to better align with the Board of Medical Examiners' standards.

0940-05-35-.07(3)

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: § 33-2-403(e), (f), and (g): What is this?

TDMHSAS Response: T.C.A. § 33-2-403(e), (f), and (g) contain billing and medical records requirements applicable to OBOT licensees.

0940-05-35-.07

ALEXANDER ZOTOS, M.D. FASAM, PRESIDENT, TENNESSEE SOCIETY OF ADDICTION MEDICINE: The initial documentation in all charts should include a HIPAA statement and a signature page that advises patient's of

their privacy rights.

TDMHSAS Response: OBOTs are subject to all federal and state confidentiality requirements, regulations, and laws, including 42 CFR 164.520, which addresses Dr. Zotos' concern.

0940-05-35-.07(4)(b)

KAREN PERSHING, MPH, CPS II, EXECUTIVE DIRECTOR, METRO DRUG COALITION: Under "consent" is where I thought there should be a separate consent for women of childbearing age that explained the risk of NAS, availability of VRLAC through local health Departments. A copy of this should be given to the patient and not just put in the chart. There should also be a pregnancy test given prior to initiating MAT and performed at least monthly as long as she remains in treatment. The Born Drug Free TN materials include a patient brochure that covers all substances that can harm a developing fetus. Don't have to use this; just thought I'd make sure you were aware that this could be used as an educational piece.

TDMHSAS Response: The Department agrees and has revised 0940-05-35-.10 to address information regarding VRLAC and NAS. Revisions to 0940-05-35-.10 require an initial pregnancy screening for women of child bearing age and potential.

Additionally, 0940-05-35-.06(2)(b) requires a Facility to inform pregnant women and women of child bearing age and potential of the risk of NAS and the use of VRLAC.

0940-05-35-.07(4)(c)

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: As written, this statement is only partially accurate. The primary disease process treated is opioid dependence. The goal of treatment of this chronic illness, as in virtually any chronic illness, is to place the disease in remission. By placing the disease in remission, certain outcomes can be reasonably expected:

- i. Premature death from overdose will not occur
- j. Premature shortening of life from accelerating of the medical complications of opioid dependence will not occur.
- k. Premature disability from the primary disease process or its complications will not occur.
- l. Improvement in judgment should occur
- m. Restoration from freedom of endless cycles with use and withdrawal will allow restoration of a normal lifestyle.
- n. The patient should be able to work, contribute to his/her family and community
- o. Economic well-being will improve for most patients

Recommendation: Revise (c).

LEAH FESTA, PREVENTION ALLIANCE OF TN: I represent the coalitions across the state and funded by the Department of Mental Health. I just have a consideration, I didn't really notice within this rule, for one of the goal Patient record requirements, it says information to each patient that goal of opiate treatment is stabilization of functioning. but I just wanted to bring to your attention that according to TIP40 protocol from SAMHSA, the goal of buprenorphine for medically supervised withdrawal from opioids is to provide a transition from the state of physical dependence on opioids to an opioid-free state, while minimizing withdrawal symptoms (and avoiding side effects of buprenorphine). So I think that was something that should be considered instead of just making everyone feel better we should be coming off of the opiates. And I also want to shadow what one of our peers said was that one on the requirements for pain management should be more stringent considering the state of the opiate epidemic.

Dr. Lloyd: I want to make sure that I understand that you want the language adjusted to say that this is to be used for detoxification purposes to have an absence based treatment?

I just feel like the goal should probably be a little higher as in opiate free.

I would ask that you consider increasing the goal of this treatment to be opioid-free in addition to "stabilization of functioning." Also, more stringent requirements for pain management professionals!

TDMHSAS Response: While the hope is that all Tennesseans are able to lead a life free of substance abuse and/or dependence, medication assisted treatment is an effective form of treatment for opioid use disorder. As each individual with an opioid use disorder works towards recovery, it is important to realize that each individual's definition of "stabilization of functioning" can differ and therefore a broad, open-ended understanding of that term is necessary.

0940-05-35-.07(4)f)

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: This is a medical service for a chronic, metabolic illness. The dialogue about the course of the illness, the response to treatment, and the patient's goals are intrinsic to a medical service for a chronic illness. (f) is an elaboration of the obvious and expected.

Recommendation: Delete (f). Implicit in the right of Review of the Department is the right to remove licensure or refer to the Board of Medical Examiners for records which are clearly substandard.

TDMHSAS Response: The Department respectfully disagrees and believes the minimum standard set out in 0940-05-35-.07(4)f) is necessary to enable the Department to justifiably take the action Dr. Conway advocates for in his comment.

0940-05-35-.07(4)g)

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: This acknowledgement that opioid dependence is a disease with an effective chronic treatment which the patient can continue on is welcomed. Thank you for including this.

TDMHSAS Response: The Department acknowledges Dr. Conway's comment.

0940-05-35-.07(5)a)

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: Language is clear and straightforward in (a).

TDMHSAS Response: The Department agrees.

0940-05-35-.07(5)b)

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: Language is clear and straightforward in (b).

TDMHSAS Response: The Department agrees.

0940-05-35-.07(5)c)

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: Language is clear and straightforward in (c).

TDMHSAS Response: The Department agrees.

0940-05-35-.07(5)d)

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: Language is clear and straightforward in (d).

TDMHSAS Response: The Department agrees.

0940-05-35-.07(5)e)

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: Language is clear and straightforward in (e).

TDMHSAS Response: The Department agrees.

0940-05-35-.07(5)(f)

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: Applied in an unthinking way, as rules often are to be in effort to be in compliance with state regulation, (f) carries great potential for patient harm. Patient's privacy rights are absolute. There are times when an intense coordination of care is essential to benefit the patient. However, the indiscriminate sharing of records is a violation of patient's rights and carries the risk of significant long term damage to the patient.

Recommendation: Complete deletion of the language of section (f). Substitute the following sentence: "Documentation of coordination of care should be present in those clinical situations which require consultation or coordination of care."

WILLIAM "BILLY" MANLEY, FNP-BC: Working to coordinate care is difficult within this population. Will the TDMHSAS be providing community training to provider regarding the epidemic and the need to work with OBOT/bup prescriber to get better outcomes for patient. Currently I regularly reach out to OB/GYN's and other provider and have less than a 50% response rate unless records are requested. Coordinating care that doesn't trigger a relapse is rarely if ever successful. If the OBOT will be governed by these rules what is the requirement for providers with legitimate relationships with our patients?

TDMHSAS Response: The Department acknowledges the concerns stated in these comments and has revised 0940-05-35-.07(5)(f) as suggested by Dr. Conway.

0940-05-35-.08(1)

TDOH: Initiate an "investigation" into the prospective patient's prior treatment may be better suited as a "request" or "search." Would one facility have investigatory authority over another?

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: Section (1) is, in my limited experience, unprecedented in medical care. The language "Investigation" is a term from criminal justice. Internal Affairs does investigations, not nurses or physicians.

The language itself frames the patient in a highly negative cognitive framework promoting arbitrary, superficial, or perhaps even discriminatory behavior on the part of the facility.

Recommendation: Section (1) should be simply deleted.

TDMHSAS Response: The Department agrees that the term "investigation" is not appropriate for 0940-05-35-.08(1) and has substituted in its place the term "inquiry"

0940-05-35-.08(1)and(2)

TDOH: Facility is defined in the rules, but clinic and program are not. If the intent is for these provider settings to be accounted for but not required to be licensed as a facility, should they be defined?

TDMHSAS Response: The Department agrees and has revised 0940-05-35-.08(1) to be more clear. 0940-05-35-.08(2) has been deleted.

0940-05-35-.08(2)

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: This section is unnecessary. All new patients are new patients.

Recommendation: Use Occam's Razor to delete, making rule shorter and more powerful.

PAUL S. TRIVETTE, EXECUTIVE DIRECTOR, PATIENT ACCESS TO ADDICTION TREATMENT: Is this taking discretion away from the facility? Can the word 'Shall' be changed to 'May'?

TDMHSAS Response: The Department agrees and has deleted 0940-05-35-.08(2).

0940-05-35-.09

ALEXANDER ZOTOS, M.D. FASAM, PRESIDENT, TENNESSEE SOCIETY OF ADDICTION MEDICINE: My most important request. Patients on maintenance for a period of 1 year or longer should be given option of being allowed every other month visits. It is not necessary to see patient's every month once they have been in treatment for over a year.

TDMHSAS Response: The Department agrees and has made changes to 0940-05-35-.09 that address the concerns presented in Dr. Zotos' comment.

0940-35-.09(1)

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: Language is clear and straightforward in (1).

TDMHSAS Response: The Department agrees.

0940-05-35-.09(2)

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: Language is clear and straightforward in (2).

TDMHSAS Response: The Department agrees.

0940-05-35-.09(3)

TDOH: The Department feels that an annual evaluation should be the standard. An annual medical examination will not always be indicated. Consider "an evaluation shall be performed annually and other medical examination or testing shall be considered as appropriate."

"All other medical procedures performed...shall be repeated." Consider clarifying this sentence to specify that review of the procedures does not include review of the results and that only new or re-affirmed clinically indicated tests should be performed.

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: These regulations for medical organizations. By definition, the patient is obtaining a physician visit month. During the monthly physician visit, appropriate medical examinations are done on each visit.

No medical specialty automatically repeats once a year the initial work simply to redo the initial work. In fact, the American College of Physicians has a central imperative for internists to only do High Value Care, and not consume unnecessary resources. This requirement is, in my opinion, low value care.

This regulation for annual medical examination is a carry-over from the OTP regulations.

With the new certification rules from the American Board of Preventive Medicine, you will be increasing dealing with physicians who are maintaining maintenance of certification in Internal Medicine or Family Medicine, with subspecialty certification in addiction medicine. In these cases, you will be dealing with extremely competent physicians.

Recommendation: Drop the requirement for annual physical examination.

WILLIAM "BILLY" MANLEY, FNP-BC: Medical care. Part of recovery is the patient learning to give health care over to someone else and learning to manage healthcare in a responsible way. This being said a prescriber provides a simple focused physical exam initially but thereafter it become the responsibility of the patient to find a pcp and manage their healthcare outside of the addiction/recovery process.

TDMHSAS Response: The Department acknowledges the comments and has revised 0940-05-35-.09(3) accordingly.

0940-05-35-.09(4)

ADAM NICKAS, CAPITOL RESOURCES, LLC: While we believe observed drug screens eight (8) times annually for a patient in the maintenance phase of treatment is the ideal best practice, we ask that the Department consider that TennCare will currently only reimburse for two drug screens for their recipients annually.

TDMHSAS Response: The Department acknowledges the concern but is dedicated to incorporating nationally recognized best practices, as required by Chapter 912 of the Public Acts of 2016, into the minimum standards for OBOTs. The Department believes observed drug screens and counseling are an essential element to effective addiction treatment, as indicated in SAMHSA's TIP 40.

0940-05-35-.09(4)(a)

KAREN PERSHING, MPH, CPS II, EXECUTIVE DIRECTOR, METRO DRUG COALITION: Stabilization phase: women of childbearing age should continue to be pregnancy tested on a monthly basis unless she can show proof of VRLAC, sterilization or hysterectomy.

TDMHSAS Response: The Department acknowledges this comment and will continue to work with our partners, both private and public, to better address the unique challenges presented by substance abuse and dependence among pregnant women and women of childbearing age and/or ability.

Revisions to 0940-05-35-.10 require an initial pregnancy screening for all women of child bearing age and potential.

0940-05-35-.09(4)(a)(1)-(4.)

WILLIAM "BILLY" MANLEY, FNP-BC: Weekly office visit are not indicated if the patient has received meds previously or off the street. Counseling twice a month may not be available or practical if the patient is live far from the facility. Observed Drug screens are not appropriate in every setting. So Oral screen would be the only alternative to meet this criteria. Results from Oral Screens return greater than five days from most labs this delays/negates their importance in weekly visits.

TDMHSAS Response: The Department respectfully disagrees and believes observed drug screens and counseling are an essential element to effective addiction treatment, as indicated in SAMHSA's TIP 40.

0940-05-35-.09(4)(a)-(b)

ALEXANDER ZOTOS, M.D. FASAM, PRESIDENT, TENNESSEE SOCIETY OF ADDICTION MEDICINE: There should be a time limit for patients requiring so much oversight. After, let's say 2-5 years, a patient should not have to be required to see counselor as frequent as the new patient. Additionally, the frequency of visits should be flexible after several years.

JAMES MANUELE, M.D., FACOG: Treatment should be individualized. It's the name of this section. Yet every patient has to undergo the same 'cookie cutter' treatment. What is the fascination with observed drug screens? Most clinics use urine for screening. Who wants to immediately be treated as dishonest that they cannot void in private? This is discriminatory to each and every patient and represents a barrier to treatment. When asked, several patients have reported that this would have been a significant factor keeping them from treatment. We don't treat other patients this way. Certainly an observed screen has its place and can be a valuable tool but a blanket requirement is arbitrary and capricious toward opiate addicts. It represents a barrier to treatment and a strain on clinical staff which will raise cost for clinics resulting in increased cost for patients.

Insurance companies, TennCare included, generally, will only pay for 4 urine confirmations a year. These requirements, will result in at least 4 uncovered confirmations. Passing that cost on to patients will result in a 40-50% increase in the cost of care the patient will have to pay unless the lab companies are willing to absorb the costs (in the face of ever declining reimbursement). My cash patients and those of several other clinic owners estimate that 50% would not be able to afford such an increase. Locally, using a 75 mile radius from my home, the result translates into roughly 700 patients unable to afford treatment and forced to seek relief in prescription

pain pills and heroin.

TIMOTHY S. SMYTH, M.D.: Please show me the data that shows that drug screening, random or otherwise, improves patient outcomes or decreases diversion. Annual, or Semi-annual RANDOM, OBSERVED UDS is a very high standard and should suffice. Creating barriers to treatment only serves to increase relapse and/or return to illicit use of Buprenorphine.

KEVIN CATNEY, M.D., DABFM, DABAM: Part of what we do every day is case management. However I have patient's that have been with me for years, who have never failed a drug screen, who own their own homes, go to work every day and live their lives fully. Why would we want to legislate that an individual must receive "case management services?" This might tick a box on a form at a large institution, but when a patient is receiving personalized care at my small practice, I know who needs "case management services." For me this is simply a redundant documentation requirement for the sake of documentation. Not every new patient needs formal case management services, and sometimes stable patients of many years suddenly do. This should be part of the personalization of care that an individual's physician makes decisions about.

DR. TOM REACH, PRESIDENT, WATAUGA RECOVERY CENTER, JOHNSON CITY: One primary concern that I've heard is the idea of counseling or counseling sessions and I fall back on the evidenced based medicine that says 2 twenty minute SBIRTs are effective in this particular population group. If we were to provide hour long sessions twice a month to 3500 patients add up the hours and count the number of providers that would be necessary to do that.

MARIE CROSSON, PhD, EXECUTIVE DIRECTOR, TENNESSEE ASSOCIATION OF DRUG COURT PROFESSIONALS (TADCP): Note on a comment about the counseling sessions. SBIRT should not be the standard for therapeutic counseling for substance use disorders. There are standards for that type that are more like 50 minutes. I'm not sure how you get a therapeutic effect in 20 minutes unless it happens very frequently.

MARY LINDEN SALTER, TAADAS: In response to a comment made at today's hearing – SBIRT is a model for screening, not intended to identify and then refer and motivate folks to access treatment. Counseling session length should support additional therapy time needed to evoke change and for skill building.

TDMHSAS Response: The Department acknowledges and agrees with comments received from Dr. Crosson. The proposed rules require that the facility determine the appropriate number and length of counseling sessions appropriate for each individual patient and be documented in the patient's individualized treatment plan.

The Department acknowledges the comments received from Ms. Salter and agrees that SBIRT should be limited to the situations in which it is indicated by the nationally recognized best practice guidelines, including those developed by SAMHSA.

The Department acknowledges the comments made about counseling and drug screens; the Department believes observed drug screens and counseling are essential elements to effective addiction treatment, as indicated in TIP 40.

The Department has revised 0940-05-35-.09 regarding increased flexibility of scheduled office visits and drug screens for patients with a year or more in the maintenance phase of treatment.

0940-05-35-.09(4)(a)(2)

KEVIN CATNEY, M.D., DABFM, DABAM: I do not believe that the definitions of "counseling session" durations are consistent with the current billing intervals used when coding office visits. In addition, I do not believe that a group counseling session needs to last for 50 minutes in order to have value. I personally employ certified peer recovery specialists in my office at all times that we are open, and they provide ongoing peer coaching. I then meet with my patients for 1:1 sessions as well. They average a total of 50 minutes in my office for the visit. I can easily adjust how I see patients to meet this criteria, but I really feel this is micromanagement of the way I care for my patients, and I believe physicians should be given some leeway, to come up with creative ideas to see what works for their own patients, and style of patient care.

TDMHSAS Response: The Department appreciates Dr. Catney's use of innovative counseling procedures. The Department will work with each facility individually to determine if activities performed by a Facility are in substantial compliance with the proposed rules.

0940-05-35-.09(4)(a)(3)

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: Medical necessity should drive the frequency and intensity of services, not an arbitrary prescription.

Recommendation: Change the language to as follows: In induction, office visits, counseling, drug screens, and case management should be done on the basis of medical necessity.

TDMHSAS Response: The Department respectfully disagrees. 0940-05-35-.09(4)(a)(3) is written to conform to best practices established in SAMHSA's TIP 40.

0940-05-35-.09(4)(b)

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: A monthly visit is standard. Monthly case management services are not medically necessary.

TDMHSAS Response: The Department respectfully disagrees. 0940-05-35-.09(4)(b) is written to conform to best practices established by SAMHSA.

0940-05-35-.09(4)(b)(1)-(4)

WILLIAM "BILLY" MANLEY, FNP-BC: Patients who are on maintenance and have proved themselves are seen by many providers every other month with random drugs or pill counts in between. This allows successful patients to feel they have moved forward in care. These requirements stop that. After 12 months successfully in a MAT, many insurance plans allow only 1 drug screen a year and require the patient to pay for the remainder. This is expensive and not appropriate for successful [patients] with a good relationship with their providers.

TDMHSAS Response: The Department is not authorized to address insurance issues via the proposed rules.

The Department has revised 0940-05-35-.09 regarding increased flexibility of scheduled office visits and drug screens for patients with a year or more in the maintenance phase of treatment.

0940-05-35-.09(4)(b)(3.)

PAUL S. TRIVETTE, EXECUTIVE DIRECTOR, PATIENT ACCESS TO ADDICTION TREATMENT: We request that this language and portion be re-evaluated. We are currently attempting to negotiate with TennCare, who will only pay for 2 drug screens per year. There are many individuals that have been in this treatment for years and doing excellent in the maintenance phase. Please take the 'Observed' portion out of the requirement. Can this be physicians' discretion?

JULIE GRIFFIN, DIRECTOR OF GOVERNMENT AFFAIRS, TENNESSEE MEDICAL ASSOCIATION: Thank you for all of the work the Department has put into the Office Based Opioid Treatment Facilities Rules. We know others brought up the urine drug screens today and we wanted to follow up. As you may or may not know TennCare will not pay for more than two (2) urine screens annually. Because of that, Rule 0940-05-35-.09(4)(b)3 may create an access to care issue. If providers are required to perform screenings above TennCare's maximum and have no ability to get reimbursed for the cost, many physicians may choose not to serve this population. Unfortunately, a provider that is signed up with TennCare has no ability to require payment for services not covered under the program.

We know that was not the intent but we are concerned that this may be an unintended consequence. We just wanted to share this with you. If you have any questions, please let me know. Thanks again for your willingness to work with us.

ALEXANDER ZOTOS, M.D. FASAM, PRESIDENT, TENNESSEE SOCIETY OF ADDICTION MEDICINE: Regarding drug screening, it is my opinion that this should be somewhat more flexible such that after a certain time like 2 years a patient's requirements should change. Costs of treatment should go down as the patient gains time and is compliant. Simply dictating the amount of testing and what type will not impact overall care. One suggestion is that the patient may have other forms of testing done such as oral swabs or even hair testing.

These will eventually be cheaper and should be afforded to the patient. Additionally a call in system could be employed like the one modeled at the TMF for recovering physicians. This will cut down on frequency needed as it would keep the patient in check at all times.

TIMOTHY S. SMYTH, M.D.: The urine drug screening requirements. 8 observed a year, I think [random observed drug screens] was the gold standard, but at least in my practice for 4 years doing 8 a year on a 100 patients is perhaps a barriers that is going to be hard for patients to overcome as far as most of my patients work or have families, poor transportation and they can't make it for their 8. If we try to call them for 8 and they can't make it, does that mean I discharge them? So I would just like to say again I think that there's been many studies that Dr. Lloyd and I have shared that show that if you put the barrier too high for [patients] to get care, then they are going to go back to using it from the street, either an illicit opiate or Suboxone.

RODNEY A. POLING, M.D., DFAPA, PRESIDENT, TENNESSEE PSYCHIATRIC ASSOCIATION: [F]ew can afford 8 drug screens per year.

TDMHSAS Response: The Department is not authorized to address insurance issues via the proposed rules.

The Department has revised 0940-05-35-.09 regarding increased flexibility of scheduled office visits and drug screens for patients with a year or more in the maintenance phase of treatment.

The Department is concerned about access to treatment; however, observed drug screens are an essential element of effective addiction treatment, as indicated in SAMHSA's TIP 40.

0940-05-35-.09(5)

JAMES MANUELE, M.D., FACOG: This is a social services requirement. Physicians practicing medicine should be practicing medicine. Social workers should be performing social services. The Department is pushing its job and the responsibility to provide social services on to clinics. The Department is burdening OBOT's with the performance of the Departments duties.

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: The entity you are regulating is small physician practices and small physician groups. This is not necessary. This is not practical. Cost burden would be excessive.

Recommendation: Entirely eliminate the section on case management.

TDMHSAS Response: The Department respectfully disagrees. The Department believes that a comprehensive range of rehabilitative services is an essential element of effective addiction treatment. The proposed rules do not require the licensed facility to provide these services; rather the facility can fulfill the requirements by an appropriate referral.

0940-05-35-.09(6)-(7)

JAMES MANUELE, M.D., FACOG: More of the same. Placing social services burdens on OBOT's and physicians when the Department is paid to provide them.

TDMHSAS Response: The Department respectfully disagrees. The Department believes that communication between doctor and patient and the patient's continued desire to participate in a particular treatment modality, are essential elements of effective addiction treatment.

0940-05-35-.09(7)

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: Opioid Dependence is a chronic, relapsing disease whose treatment is methadone maintenance treatment or buprenorphine maintenance. Patients can and do request to stop both methadone maintenance treatment and buprenorphine treatment. Their decisions are honored, and treatment in both setting is discontinued.

Histories taken from patients with a duration of illness of one to two decades routinely shows patients who are both on and off treatment, often multiple times, often for months to years, for a multitude of reasons.

TIMOTHY S. SMYTH, M.D.: Please provide evidence that shows that tapering a patient decreases relapse or increases functioning of any patient. Why are we forced to offer a treatment that is known to not work?

TDMHSAS Response: The Department respectfully disagrees. The Department believes that communication between doctor and patient and informing the patient of an array of treatment options are essential elements of effective addiction treatment.

0940-05-35-.10

WILLIAM "BILLY" MANLEY, FNP-BC: Under special populations - the LGBTQI community has been understood to be an at risk group for addiction issues requiring sensitivity and training for providers. This should be included that the OBOT-providers/staff be aware of support services and affirming services for this population. TDMHSAS could research and create a list of TN services for this population and provide it on their government website.

TDMHSAS Response: Opioid use disorder affects different special population groups in varying ways. Case management is one tool that providers can use to address each individual in a special population group in an individualized manner.

0940-05-35-.10(1)

TDOH: Women of reproductive age should be offered referral to services that provide voluntary, reversible, long-acting contraception.

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: Language is clear and straightforward in (1).

TDMHSAS Response: The Department has made changes to 0940-05-35-.10 to ensure that pregnant women and women of child-bearing age and potential have been informed of the risks and benefits of the utilization of VRLAC.

0940-05-35-.10(1)(a)

CARLA SAUNDERS, APN, NNP-BC, ADVANCE PRACTICE COORDINATOR, PEDIATRIX MEDICAL GROUP, EAST TN CHILDREN'S HOSPITAL: This sentence reads a bit funny and having this discussion at this time is like closing the barn door after the horse escapes. ** As high as 86% of pregnancies occurring in opioid using women are unintended. According to the TN NAS reporting data, nearly 70% of the approximately 1000 babies reported to the state with a NAS diagnosis are due to MAT. The average cost of treatment for one baby with NAS in TN is somewhere around \$56,000. That is ~ \$56,000,000 a year for the state 70% of which, ~\$39,200,00, would be the result of MAT. Family planning must go beyond "informing" the patient, it should be an integral part of the treatment and recovery program. Furthermore, pregnancy testing should occur at intake and with all drug screens as many women do not acknowledge they are pregnant until they are well into the pregnancy, increasing the risk of adverse outcomes for both mother and baby in this very high-risk population.

The birth of a child is a major life stressor and only makes the situation more difficult. Many mothers are living in unstable environments and have little or no income. Hormone fluctuations during and after pregnancy can make mental/emotional health and stability more challenging. Almost every woman I speak with postpartum is receiving an opiate for pain management post delivery, even for vaginal births, despite known drug use histories. Add the guilt these mothers feel, plus DCS involvement, and you have a recipe for relapse. Continued debate over best practices for treatment of pregnant women is likely to continue for a while. Not all OBs are asking the right screening questions, not all newborn nurseries have protocols in place to screen for babies who might be at risk for NAS (an AAP rec), and not all pediatricians are monitoring at-risk newborns for the AAP rec 3-7-day minimum. Maternal Hepatitis C rates are increasing exponentially, and their babies need titers at 18-24 months but follow up show rates are poor for these babies.

I have been working with psychiatry, and developmental follow-up as part of my doctoral work and the behavioral problems these children are experiencing is astounding. TennCare does not pay for behavioral therapy in children with IDE or NAS. They require medications to "control" their aggressive often violent behaviors, impulse control, mood disorders, anxiety, and sleep disorders enough to keep from harming others and themselves. And these are the children in adoptive families with strong support and resources.

We can debate etiologies and request empiric evidence all day long. The solution is simple, LARCs. Will they eliminate the problem? No. Do we need studies to provide evidence-based practices and protocols for identification, assessment, and treatment of pregnant women with substance use disorders and babies with NAS? YES! Can we significantly reduce the financial strain on our state health care and social services systems? YES! The prevention of just one unintended pregnancy and infant with NAS would pay for a significant number of LARCs and pregnancy tests. There are programs across the state that provide free and quick access to LARCs by reputable physicians, without coercion or reward.

Educational programs need to be in place for women and providers about the potential risks of intrauterine drug exposure from MAT, the potential for NAS, and possible associated long-term concerns. I would propose that an education plan should be a requirement for clinic licensure as well as the prescriber. There are excellent educational programs available that can be done on site at the initial visit and would not take any time away from the busy provider. We also need to look at the reporting system to see what we can tweak to assess the impact on NAS.

NOW is the time to set the bar high. The future of the women and children in our state are in our hands. As the voice for the mothers and babies who have asked me to help, I sincerely thank you for taking the time to read and think about what can and should be done.

TDMHSAS Response: The Department has made changes to 0940-05-35-.10 to ensure that pregnant women and women of child-bearing age and potential have been informed of the risks and benefits of the utilization of VRLAC.

0940-05-35-.10(2)

TDOH: Consider referring high risk patients to licensed pain management clinics or pain management specialists.

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: The Facility shall ensure that employed physicians are knowledgeable in the management of opioid use disorder in a context of chronic pain and pain management.

Language is clear and straightforward in this sentence of (2).

Individuals being treated with opioids for chronic or acute pain, who have become physically dependent in the course of their medical treatment, should be treated in a medical or surgical setting due to the possibility that this type of patient may need a higher dosage of pain medication to achieve adequate pain control.

I do not know where you are going with this sentence. Addiction treatment is for addiction, not for chronic pain. This sentence says that patients who do not have an addiction should not be treated for addiction.

Individuals who are addicted to opioids, demonstrating drug-seeking behavior, or performing illegal drug-related activity, and who also need treatment for pain may be enrolled in the Facility.

This sentence is unclear. Is the implicit connector "and" or is the implicit connector "Or" between addictions, demonstrating drug seeking behavior, or performing illegal drug-related activities. If the connector is "and", then the patient has an addiction. If the connector is "or", then the patient may not have an addiction.

...but the Facility shall ensure continuity of care and communication between treatment programs or physicians regarding patients receiving treatment in both non-residential office-based opiate treatment facility and a facility or physician's office for purposes of pain management, with patient consent.

This is complicated management. This clinical scenario should be the exception, not the common place. Acute pain management with acute medical illness requiring surgery or ICU is the most common situation, in my experience, requiring judgment about buprenorphine and pain. I have never had a patient under my care or our group's care enrolled simultaneously in long term chronic pain management.

Recommendations: Delete the entire content of (2). Consider substituting the following:

(2). Pain Management: The treatment of comorbid chronic pain in a patient with primary opioid dependence on buprenorphine maintenance treatment must be primarily managed by a certified addiction psychiatrist, a certified

addiction medicine, or a physician who has received consultation and an ongoing 20% chart of review on this patient.

TDMHSAS Response: The Department agrees with TDOH's comment and has made the appropriate clarifying changes.

The purpose of this provision is to address individuals who have both chronic pain and addiction issues. The Department is aware of instances where individuals without an opioid use disorder have sought pain treatment at an addiction treatment facility.

0940-05-35-.10(3)

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: Language is clear and straightforward in (3).

TDMHSAS Response: The Department agrees.

0940-05-35-.10(4)

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: Language is clear and straightforward in (4).

TDMHSAS Response: The Department agrees.

0940-05-35-.10(5)

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: Language is clear and straightforward in (5).

TDMHSAS Response: The Department agrees.

0940-05-35-.11

MARIE CROSSON, PhD, EXECUTIVE DIRECTOR, TENNESSEE ASSOCIATION OF DRUG COURT PROFESSIONALS (TADCP): Note on a comment about the counseling sessions. SBIRT should not be the standard for therapeutic counseling for substance use disorders. There are standards for that type that are more like 50 minutes. I'm not sure how you get a therapeutic effect in 20 minutes unless it happens very frequently.

TDMHSAS Response: The Department agrees and SBIRT is not used as a standard for therapeutic counseling in the proposed rules.

0940-05-35-.11(1)-(3)

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: Language is clear and straightforward in (1) through (3) of Counseling.

TDMHSAS Response: The Department agrees.

0940-05-35-.11(3)(a)(iii)

PAUL S. TRIVETTE, EXECUTIVE DIRECTOR, PATIENT ACCESS TO ADDICTION TREATMENT: Do specific credentials exist for this requirement? Can a physician do the individualized counseling?

TDMHSAS Response: The term "counseling" or "counseling session" is defined in 0940-05-35-.02(2)(e) and requires counseling to be led or facilitated by a qualified provider (as defined in 0940-05-35-.02(2)(v)).

A physician is qualified to provide individualized counseling.

0940-05-35-.11(4)

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: Many of the

mental health centers prefer to make their own appointments with their clients. Other than calling the crisis team for acute emergencies, it is not traditional to make an appointment from a physician's office with mental health. This would also add a significant cost burden to the office if consistently required.

Recommendation: Delete the following language: making appointments on the patients' behalf.

TDMHSAS Response: The Department has made a change to 0940-05-35-.11(4) in response to Dr. Conway's comment.

0940-05-35-.12

KEVIN CATNEY, M.D., DABFM, DABAM: PMP (CSMD) should be checked prior to the initial prescription being written, at approximately one month or treatment, and then every 1 to 3 months based on duration in treatment, and stability. It is over kill to require the (CSMD) to be checked at every visit. The pharmacist is already entering the data at every prescription fill occurrence, and should be calling the physician if there is a discrepancy (that is the relationship that I have with most of my pharmacies: they are not going to fill a prescription for a controlled substance from another practice without consulting with me first). The biggest problem we have, with duplicative opioid prescriptions, and with providers of Emergency Services, who continue to cling to their exemption from the requirement to consult the PMP. I have patient's who all the time bring me prescriptions written for opioids by emergency service providers, despite the fact they reported to the triage nurse that they would on Medication Assisted Therapy and didn't want any addictive prescriptions. The emergency services provider still writes an opioid? This really should be addressed. Recommend eliminating the exemption from consulting the PMP (CSMD) for emergency services providers. Recommend require MAT physicians to follow the CDC opioid prescribing guidelines in regards to consulting the PMP (CSMD) and not creating yet another set of regulations.

TDMHSAS Response: The Department respectfully disagrees. The Department believes that checking the CSMD is an essential tool in the effective practice of addiction treatment.

0940-05-35-.12(1)

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: Language is clear and straightforward.

TDMHSAS Response: The Department agrees.

0940-05-35-.12(1)(a)(1.)

TIMOTHY S. SMYTH, M.D.: These considerations are moot in TN. Pharmacies will not provide the product and the TN "Addiction Treatment Act of 2015" does not allow one to use economic reasons for prescribing a bioequivalent drug; e.g. we cannot prescribe generic mono-product Buprenorphine except under very restrictive circumstances.

TDMHSAS Response: The Department seeks to allow physicians the flexibility to practice medicine with their patients while ensuring that the proposed rules comply with all statutory requirements.

0940-05-35-.12(2)

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: Language is clear and straightforward.

TIMOTHY S. SMYTH, M.D.: Please show me the data that shows that checking the CSMD more frequently or less frequently improves patient care or decreases diversion or overdose deaths. Semi-annually, or quarterly is an adequate standard.

ALEXANDER ZOTOS, M.D. FASAM, PRESIDENT, TENNESSEE SOCIETY OF ADDICTION MEDICINE: Checking the database at every visit. Please limit to official visits when seeing doctor or provider. If they come in for screen or pill count this would be too burdensome.

MITCHELL MUTTER, M.D., TENNESSEE DEPARTMENT OF HEALTH: Query of the database, it was a little vague in there. It says every visit but sometimes [patients] are just coming in for counseling sessions or something like that and usually your counselor doesn't have access to the database. It's usually only those people with DEA numbers that are registered in the database. So you might make that clearer.

TDMHSAS Response: The Department believes that checking the CSMD is an effective tool in the practice of addiction treatment.

The Department recognizes the need for clarity in defining what type of "visit" requires a check of the CSMD and has changed 0940-05-35-.12(2) to reflect this.

0940-05-35-.12(3)

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: A monthly review of the Prescription Monitoring Data Base will show if the patient is receiving buprenorphine from more than one OBOT or physician. Section (3) is redundant.

Recommendation: Delete (3) for Occam's Razor.

TIMOTHY S. SMYTH, M.D.: What does this mean? How does a facility do this?

TDMHSAS Response: The Department has deleted 0940-5-35-.12(3).

0940-05-35-.12(4)

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: Comments on (4): Benzodiazepine Use: This is a well done discussion on a difficult topic. However, I believe these rules should use a simpler approach.

Recommendations: Consider the following paragraph:

Benzodiazepines in combination with buprenorphine are high risk. For the vast majority of patients, benzodiazepines are absolutely contraindicated in combination with buprenorphine. For an occasional patient, benzodiazepines are relatively contraindicated in combination with buprenorphine. In those selected patients being prescribed buprenorphine who are either being continued on or being tapered off benzodiazepines, the management should be done by a specialist in addiction medicine or addiction psychiatry.

TIMOTHY S. SMYTH, M.D.: Please show me the data that indicates that a patient who is suffering from the disease of opioid addiction cannot safely utilize an anxiolytic such as benzodiazepines. Where is the data demonstrating harm when these medications are combined **and used properly**, as described?

TDMHSAS Response: The Department believes that there are relative contraindications regarding a patient's simultaneous use of benzodiazepines and buprenorphine as evidenced by the recent med safety advisory published by the FDA regarding concurrent use of benzodiazepines and opioids.

The Department appreciates Dr. Conway's suggested language; however, the Department believes the language of the new 0940-5-35-.12(3) is clear.

0940-05-35-.12(4)(a)&(c)

TIMOTHY S. SMYTH, M.D.: These two sections contradict each other: (c) contradicts (a); "benzodiazepine use disorder" overlaps or is equal to "a history of misusing or abusing these products"

TDMHSAS Response: The Department respectfully disagrees. The new 0940-05-35-.12(3)(a) speaks to a patient's being prescribed benzodiazepines only after evaluation by a board certified psychiatrist; the new 0940-05-35-.12(3)(c) allows a physician with a DATA 2000 waiver to manage a patient with a benzodiazepine prescription if the patient is willing to initiate a program of tapering.

0940-05-35-.12(4)(d)

KEVIN CATNEY, M.D., DABFM, DABAM: The doses in section 1. (i) and (iii) seem to be inconsistent.

TDMHSAS Response: The Department has revised this provision in order to clarify the

provision's intent.

0940-05-35-.12(5)

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: It is standard in medical practices to keep a medication list. It is standard to update this list on each visit. However, it is not standard to actively obtain information from multiple other specialists and subspecialists on their prescriptions to shared patients. An active administrative query from multiple subspecialists would also be cost prohibitive. This requirement adds a substantial cost burden with minimal clinical impact upon patient care.

Recommendation on (5): Completely delete all current sections of (5). Substitute the following sentence for (5): An active medication list will be kept in the medical records.

TDMHSAS Response: The Department respectfully disagrees. The Department stresses the importance of medication reconciliation, as recommended by current nationally-recognized best practice guidelines, as prescription medications from providers outside of the Facility may interfere with a patient's recovery, interact with medication-assisted treatment medication, or interfere with the patient's drug screens.

0940-05-35-.13

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: Language is clear and straightforward.

KEVIN CATNEY, M.D., DABFM, DABAM: The frequency of testing should probably be every other week until stable (optionally every week). The problem is that if the practice sends their urine drug screens out to reference lab, when the patient returns the second week, that is when the test is reviewed with the patient, and Motivational Interviewing and Relapse Prevention Counseling is employed at that visit. It would then make more sense to obtain the next drug screen the third week, to assess the effectiveness of that intervention. If point of care testing is used, then the weekly approach could be affective. However, from a practical standpoint, many patients spend a fair amount of time in the lab, before being able to produce an observed urine collection (ie: shy bladder syndrome). If they are in the lab, they aren't in group with my certified peer recovery specialist. For this reason, I prefer to use an every other week approach until stable.

TDMHSAS Response: The Department acknowledges these comments. The proposed rules outline the minimum program requirements for OBOTs. Licensed facilities may choose to provide more services than required by the rules.

0940-05-35-.13(2)

PAUL S. TRIVETTE, EXECUTIVE DIRECTOR, PATIENT ACCESS TO ADDICTION TREATMENT: Please re-evaluate the frequency.

TDMHSAS Response: The Department made changes that address the frequency of drug screens for individuals in the maintenance phase for one year or more.

0940-05-35-.13(6)

TDOH: Consider adding the interpretation of the toxicological test or urine drug test to the documentation in the record.

TDMHSAS Response: The Department believes that the language of the proposed rule addresses this issue. The intent of the rule is to address inconsistent drug screens.

0940-05-35-.14

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: Language is clear and straightforward.

TDMHSAS Response: The Department agrees.

0940-05-35-.15

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: Language is clear and straightforward.

TDMHSAS Response: The Department agrees.

0940-05-35-.16(1)

ADAM NICKAS, CAPITOL RESOURCES, LLC: Please clarify whether such reports, forms, and correspondence are required to be submitted only upon "request or inspection" or "within five business days of sending or receiving such documents" regardless of such a request or inspection.

TDMHSAS Response: The reports, forms and correspondence shall be available upon request or inspection by the Department AND those reports, forms and correspondence from the TDOH health-related boards, FDA, DEA, SAMHSA or other applicable federal agencies shall be sent to the Department's Office of Licensure within 5 business days of sending or receiving such documents. Any questions regarding the proposed rules can be directed to the Department's Office of Licensure.

0940-05-35-.16(1)(b)

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: This is very broad and open ended. Delete (B).

TDMHSAS Response: The Department respectfully disagrees. The Department's Office of Licensure requires access to all documents and information necessary for it to conduct an effective investigation and survey of a licensed facility.

0940-05-35-.16(3)

MITCHELL MUTTER, M.D., TENNESSEE DEPARTMENT OF HEALTH: Appropriate amount of time needs to be defined.

TDMHSAS Response: The time will be determined on a case-by-case basis in each investigation or survey.

0940-05-35-.17

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: Language is clear and straightforward.

TDMHSAS Response: The Department agrees.

0940-05-35-.18

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: Language is clear and straightforward.

ADAM NICKAS, CAPITOL RESOURCES, LLC: While having a community relations plan and assigned personnel to oversee such a plan are both commendable and agreeable, a facility should not be held "responsible for ensuring" its patients' actions, especially beyond the facility's premises. We ask that you remove item (2) and instead address the loitering concerns in item (3). Under item (4), each facility should only be required to include documentation of their good faith attempts to resolve legitimate issues identified by community members. In addition to our request to remove item (2), below is suggested language for items (3) and (4).

(3) Each Facility shall provide TDMHSAS, when requested, a specific plan describing the actions it will take to assure responsiveness to community needs. This plan may include an acknowledgement in the patient agreement of the conduct expected of patients' upon entering, while within, and upon exiting the Facility.

(4) Each Facility shall document community relations efforts and community contacts, including reasonable actions taken in response to legitimate issues brought to the facility's attention by community members or patients.

TDMHSAS Response: The Department agrees and has revised the language of 0940-05-35-.18(2) rather than remove it. The Department respectfully disagrees with the need to revise 0940-05-35-.18(3) and (4).

0940-05-35-.18(2)

JAMES MANUELE, M.D., FACOG: How can a Facility be "responsible for ensuring patients do not cause unnecessary disruption to the community?" Loitering at the facility, sure. If they abuse their medicine and crash into the local Walmart, a Facility can't be held responsible for another's poor judgement which is out of it's control any more than a car manufacturer or Budweiser. If a patient relapses, and commits a crime, this section holds the Facility responsible. This is too broad, too onerous a requirement for ANY facility to operate under.

TDMHSAS Response: The Department has revised the language of 0940-05-35-.18(2).

0940-05-35-.18(3)

JAMES MANUELE, M.D., FACOG: See above. Patients compliant with treatment can better work, maintain family and legal responsibilities. In general, they are better citizens and MORE productive members of our communities.

TDMHSAS Response: The Department agrees.

0940-05-35-.19(1)

TDOH: For initial employment, consider requiring licensure verification, validation of training received by personnel and verification of education or degrees, where appropriate. During continued employment, consider requiring proof of updated continuing education and training, where appropriate.

TDMHSAS Response: 0940-05-06-.04 of the Department's general program rules applicable to all licensed services facilities requires that an employee's personnel record contain license verification, validation of training received, and verification of education or degrees, where appropriate. Education and training is necessary for retention of a professional license.

0940-05-35-.19(2)

DR. TOM REACH, PRESIDENT, WATAUGA RECOVERY CENTER, JOHNSON CITY: Under staffing page 18 #2, one specific concern that some asked me to bring up was under the director of the facility. And the way that this was written specifically it says that the facility director, the facility shall designate in writing a facility director who is responsible for the operation of the Facility and overall compliance with federal, state and local laws and regulations, operation of non-residential OBOT and for all employees including practitioners. Now that has become a big concern for some folks. Because the facility director is presumably not a physician, and yet he's taking responsibility for practitioner's agents and persons he is overseeing practicing medicine. And that role should really fall under the medical director's role. so if the facility director should be over seeing the facility and think this was all language that came out of probably the methadone original methadone language where there was one medical director who was the facility director who had oversight over everybody in the facility, so I would just point that out that that is one of those items that we probably ought to look at changing.

Dr. Lloyd: Dr. Reach what is the recommendation?

Dr. Reach: That the facility director is not responsible for the practitioner's agents and others providing medical services at the facility. I would say the facility director could oversee counseling, case management, group therapy, all of that would be a normal role for a facility director under our present model, but not overseeing the

practice of medicine, that was a concern.

TDMHSAS Response: The Department agrees with comments received regarding limiting the facility director's responsibility to oversee the Facility's medical staff.

The Department has revised the definition for facility director to clarify that a non-physician facility director shall not supervise medical staff.

0940-05-35-.19(2)(a)

DR. TOM REACH, PRESIDENT, WATAUGA RECOVERY CENTER, JOHNSON CITY: Eliminate the word "practitioner". As I mentioned, it is inappropriate to ask a non-physician to be responsible for the medical practice of a physician or midlevel provider. This provision should be moved to the responsibilities of the Medical director.

TDMHSAS Response: The Department agrees and has made this change.

0940-05-35-.19(2)(b)

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: Addiction Medicine Groups prescribe buprenorphine to a small number of patients pursuant to federal regulation. A practice of addiction medicine devoted to Buprenorphine remains and will continue to remain a part-time activity for subspecialist in Addiction Medicine. If the group office is open 8AM to 5PM for telephone, administrative work, and therapy, actual patient care involving physicians is significantly less than 50% that the office is open. This is an arbitrary requirement which is unnecessary.

Recommendation: Please delete the entire sentence: "The medical director shall be physically present at the Facility the equivalent of fifty (50) percent of the time the Facility is open to the public each week."

PAUL S. TRIVETTE, EXECUTIVE DIRECTOR, PATIENT ACCESS TO ADDICTION TREATMENT: There is some concern surrounding the requirements for a Medical Director. In many instances there are physicians unrelated to one another by contract or agreement that are practicing in a facility / setting. The physicians may or may not be practicing together within the facility at any given time and this rule would require that one physician oversee the practice of the other physician when the two are unrelated.

If each physician owns his/her medical practice and has contracted with a facility to provide counseling and support services then it becomes difficult to have a physician serve as a medical director over another physicians' separate practice that may be operating in the same facility.

Please include some type of exception that the 'Facility Director' is responsible for the operation of the facility and compliance with applicable laws. Possibly language such as, "If one or more physicians are unrelated by business agreement or contract then each practitioner shall serve as a medical director for his/her practice or if by agreement, more than one practice."

Would the Department also consider a 'Medical Director Board?' The Medical Director Board could consist of two or more physicians that are responsible for the medical services?

DR. TOM REACH, PRESIDENT, WATAUGA RECOVERY CENTER, JOHNSON CITY: One [comment] in particular is under the qualifications of the medical director and it requires and I mentioned this to Dr. Lloyd already it mentions the medical director needs to be in the facility 50% of the time. The way addiction medicine works because of DATA 2000 regulations most physicians only work one or two days in addiction medicine at most, they have other jobs, they work emergency medicine, they work family practice and it's impractical for a medical director [to be at an OBOT 50% of the time]. Now the goal of a medical director is to increase quality of care, to improve care for patients, to make sure that physicians under him are practicing good medicine according to best practices and that can be done by electronic chart review, through oversight, and the actual physical presence of a medical director in a facility. I think a 20% number, which is consistent with pain management guidelines, is a much more reasonable approach. That was one of my primary concerns.

As mentioned in the meeting, the purpose of the medical director is to oversee and ensure best practice by the other providers. The purpose of the rule is to prevent someone from Oklahoma from being the "director" and never showing up at the clinic. I think a good compromise is to make it 20% of the time, which works out to one day a week. Personally I am available 24/7 for all 35 of my providers at all 8 facilities, and constantly review

everyone's charts... 15-20% chart review on at least a quarterly basis, more frequently or even 100% if I have a problem prescriber.

ADAM NICKAS, CAPITOL RESOURCES, LLC: May two facilities that fall under the same governing body each have their own designated "medical director?"

MITCHELL MUTTER, M.D., TENNESSEE DEPARTMENT OF HEALTH: Medical director on site [requirements re: 50% provision] should be [applied to situations with] 2 [OBOTs], not 3 [OBOTs] (3 times 50% equals 150%). But in terms of what Dr. Reach said maybe they would not be on site 50% of the time but at least they would be available 50% of the time if you just had two [OBOTs].

TDMHSAS Response: The Department agrees and has changed the requirement regarding the percentage of time a Facility's medical director shall be physically present at the Facility.

0940-05-35-.19(2)(c)

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: Language is clear and straightforward.

TDMHSAS Response: The Department agrees.

0940-05-35-.19(2)(d)

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: This section is irrelevant per federal regulation. Physician assistant and Advance Practice Nurses cannot prescribe buprenorphine.

Recommendations: Delete (d).

TDMHSAS Response: The Department is supportive of mid-level practitioners performing services at an OBOT as long as those services comply with all federal and state rules, regulations, and laws.

0940-05-35-.19(2)(e)

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: It is not standard in medical practice for a solo practitioner or a small medical groups to provide case management. Unless the group has the luxury of having a BSW or MSW, which my group does not, case management services cannot be provided. Furthermore, the majority of patients in physician's practices for buprenorphine do not require case management. Consistent with common sense regulation is not increasing the cost burden to the practice.

Recommendation: Delete section (e).

PAUL S. TRIVETTE, EXECUTIVE DIRECTOR, PATIENT ACCESS TO ADDICTION TREATMENT: This rule would require that the facility hire a 'Qualified Professional' to serve as the case manager. We previously discussed only requiring the activity and not a requirement to have a 'qualified professional.' Please also include the language, "Shall provide case management services by an employee of the facility or by referral to a qualified agency."

TIMOTHY S. SMYTH, M.D.: Who is a qualified professional?

TDMHSAS Response: The Department believes that case management is an essential element of effective addiction treatment as established by SAMHSA.

The language of 0940-05-35-.19(2)(e) does not require an OBOT to hire staff to serve as a case manager; however, it does require an OBOT to provide those services. These services can be provided by any qualified provider, whether the qualified provider is employed by the Facility or contracted by the Facility to provide the services.

Additionally, the Department has made a change to this provision. The term "qualified professional" has been replaced by the term "qualified provider", which is defined in 0940-05-35-.02(2)(y).

0940-05-35-19(3)(a)

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: Language is clear and straightforward.

TDMHSAS Response: The Department agrees.

0940-05-35-19(3)(b)

JAMES MANUELE, M.D., FACOG: The medical director must be board certified in Addiction Medicine and a Psychiatrist. How many physicians are actually available? Not many. Moreover, they can only work at 3 Facilities being present 50% of the time the Facility is open. This further narrows the access to a Medical Director. The result is fewer clinics, longer travel times for patients to be treated and a general decrease in access to care. Limiting the number of clinics and access to care is the wrong approach. ABAM is no longer certifying physicians in Addiction Medicine so why is this a requirement?

JOHN WOODS, M.D.: My name is Dr. John Woods, and I am a board-certified addictionologist practicing in Jackson, Tennessee. I am personally in recovery from opiate addiction, and my medical license is on probation through September 2017 due to actions I took while I was active in my addiction over five years ago.

I am writing to ask for the removal from the finalized regulations the proposed requirement [0940-05-35-19(3)(b)] that medical directors of office-based opiate treatment (OBOT) facilities possess unrestricted medical licenses. Because of my medical license probation, under the currently proposed regulations I would not be allowed to serve as medical director of an OBOT facility.

I believe that this requirement is misguided and counterproductive. My personal experience with addiction led me to specialize in the treatment of addiction, and I have found that my experience gives me a unique credibility with many of the patients that I treat. I submit that my license probation does not detract from my ability to direct the treatment provided by OBOT facilities, and I will not be able to expand my services to a population that needs them unless this proposed requirement is removed.

Despite my license probation, and with full knowledge of my addiction history, the American Board of Addiction Medicine in 2012 allowed me to sit for the addiction medical credentialing examination, and awarded me Diplomate status later that year.

Despite my license probation, and with full knowledge of my addiction history, I was hired as an addictionologist at both Cumberland Heights and The Recovery Ranch, two respected residential addiction treatment facilities in Middle Tennessee.

Despite my license probation, and with full knowledge of my addiction history, I have been asked to consider a part-time faculty position with the new Center for Addiction Services at the University of Tennessee Health Science Center in Memphis.

And despite my license probation I have been credentialed as an in-network behavioral health provider with Blue Cross Blue Shield of Tennessee, Cigna, and Aetna insurance companies.

If my credentials and qualifications are deemed acceptable by our specialty's recognized credentialing board, to reputable addiction treatment facilities, to insurance companies, and to the University of Tennessee, please make them good enough to serve as medical director of an OBOT facility in Tennessee.

KAREN PERSHING, MPH, CPS II, EXECUTIVE DIRECTOR, METRO DRUG COALITION: Should end be "or" instead of "and" going into number 2?

ADAM NICKAS, CAPITOL RESOURCES, LLC: We request that instead of both certifications being required, that only one of the two certifications (or exam eligibility) be required.

PAUL S. TRIVETTE, EXECUTIVE DIRECTOR, PATIENT ACCESS TO ADDICTION TREATMENT: The "And" needs to be changed to "Or." Also, ABAM is not offering board certification exam in 2016 or 2017, which may create difficulty in finding a physician, who is board certified or eligible. Please include, "Exam eligible by the Board of Preventative Medicine."

Please also clarify what the license means "In good standing." There may be physicians that are part of the TMF that his/her license may be on 'probation.'

TIMOTHY S. SMYTH, M.D.: The "and" here should be "or".

KEVIN CATNEY, M.D., DABFM, DABAM: A solo practitioner qualified by 42 CFR part 8 to see up to 275 patients (qualified as defined in the federal law) should not be disqualified by Tennessee State law from supervising themselves. A solo practitioner in private practice shouldn't have to hire another individual to come in to their practice to supervise them (particularly in light of the requirement that the medical director be present 50% of the time that the office is open).

The definition states that: (1) Medical Director must be Board Certified in Addiction Psychiatry, or Board Eligible in Psychiatry with 2 years of documented experience and (2) Medical Director must be Board Certified as an addiction Medicine Specialist by (ABAM.) (no such thing as board eligible by ABAM anymore.)

There is currently no such thing as board eligible in Addiction Medicine by (ABAM). The last ever board examination in Addiction Medicine by ABAM was given in the fall of 2014. The American Board of Medical Specialties (ABMS) announced recognition of the subspecialty of Addiction in October 2015. In order to become certified in the sub-specialty of Addiction (BCADN) by The American Board of Medical Specialties, an individual must already be Board Certified in Addiction by ABAM plus they must be Board Certified by another ABMS parent board. If they are not currently ABAM Board Certified by ABAM, they will need to complete a fellowship in Addiction Medicine. This fellowship must occur after completion of a primary residency in another ABMS parent board sociality, obtaining Board Certification in that specialty, and then passing a yet another certification examination in Addiction. At that point, the individual would be Board Certified in Addiction by the ABMS (not by ABAM). The first such ABMS examination has yet to be scheduled. This section is extremely problematic, as it will severely restrict access to treatment for addiction.

I would argue that a Board Certified Physician in a Primary Care Specialty (ABMS Board Certified) who is also ABAM Board Certified and therefore ABMS Board Eligible in Addiction (AND), is immanently qualified to care for individuals being treated for opiate addiction, and also qualified to serve as a Medical Director. In fact, they may be better qualified to serve in this capacity that a Psychiatrist, because they are capable of supervising the physical component as well. This is actually a more holistic approach to the total care of patients.

I would recommend that either Board Certification in Psychiatry with (2) years of documented experience in addiction OR Board Eligibility in Addiction (ABMS) with Board Certification in an ABMS parent Board. Once the final rules for Board Certification in Addiction are made, individuals who are Eligible in Addiction (AND) (ABMS) should take the necessary steps to become certified as quickly as possible. I see no reason to allow psychiatrists that are not Board Certified to serve as Medical Directors (they can serve as treatment providers). Board Certification should be the ultimate qualifier in this important roll.

TDMHSAS Response: The Department believes that OBOT patients can benefit from the care of physicians who have had issues with substance abuse and the proposed rules allow physicians in recovery and who are working with the Board of Medical Examiners and treatment assistance entities, such as the Tennessee Medical Foundation, to continue to serve their patients and even serve as the medical director of an OBOT if their license to practice medicine or osteopathy is unrestricted.

The Department agrees and has changed the requirement regarding the percentage of time a Facility's medical director shall be physically present at the Facility.

In order to clarify the language of 0940-05-35-.19(3)(b), the Department has deleted the language "and in good standing".

The Department has made a change to this provision. The word "and" between 0940-05-35-.19(3)(b)(1) and (2) has been replaced with the word "or".

The Department recognizes that, in certain scenarios, a physician may be designated as their own medical director.

0940-05-35-.19(3)(b)(2.)

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: The major groups in Addiction Medicine will be led by a physician with specialty qualifications by ABAM, or ABPM, as well as primary certification by American Board of Internal Medicine or Family Medicine. The major groups of Addiction

Psychiatrists will be led by physicians fully credentialed in psychiatry and the subspecialty of addiction psychiatry. All of the major groups in Addiction Medicine or Addiction Psychiatry will be able to meet your requirements for a medical director who is fully credentialed. Your requirements will already be met in a well-run group practice. As you have defined a subcategory of OBOT as an entity which includes unrelated physicians practicing at the same office or location, I would not assume that there is a certified physician by ABAM or in Addiction Psychiatry will practicing in a geographically defined OBOT. A geographically defined OBOT will struggle with your requirements.

Recommendation: Please delete the section "exam eligible" for certification in Addiction Medicine. There is no such category now. This ambiguous statement will add difficulty in the licensing process.

TDMHSAS Response: The Department acknowledges the concerns contained in Dr. Conway's comment; however, the Department does not wish to limit access to treatment by making the qualifications for medical director too stringent.

The Department has modified the second clause of 0940-05-35(3)(b)(2) regarding the qualification requirements for a medical director to require two (2) years of documented experience in the treatment of persons who are addicted to alcohol or other drugs in addition to the requirement of being exam eligible for certification as an addiction medicine specialist.

The Department acknowledges that the exam for certification as an addiction medicine specialist has not been scheduled by either the American Board of Addiction Medicine or the American Board of Preventative Medicine but has kept the language regarding "exam eligible" in 0940-05-35(3)(b)(2) the same. Lack of a scheduled exam date by either entity does not affect a physician's status as "exam eligible".

0940-05-35-.19(3)(c)

JAMES MANUELE, M.D., FACOG: Program Physicians. As written with the 1 year of required experience, severely limits recruiting new physicians into engaging in treating addicts. Again, this will result in severely limiting physicians' ability to enter the field. We need more doctors treating patients not fewer.

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: The Sentence, "have had at least one (1) year of documented experience in the treatment of persons addicted to alcohol or other drugs" is problematic. A year of documented experience in treatment of addictions is hard to measure. Is this full time? Is this part time? How part time is part time? There are very few physicians in Tennessee who will meet this test. This test also eliminates physicians new to the field. I would note, that if you would have applied this test this year to the physicians in our newly found group, I am the only physician in my group who would have qualified. No one else in my group would have been capable of working in Tennessee.

Recommendation: Delete the requirement for program physicians to have one year of documented experience in treatment of addictions, or rewrite the requirement as follows: "have at least one year of documented experience in the treatment of persons addicted to alcohol and other drugs, or work under the supervision of an ABAM certified, or ABPM physician with a subspecialty certification in Addiction Medicine, or a certified Addiction Psychiatrist with a required 20% chart review for one year."

TIMOTHY S. SMYTH, M.D.: Where is the physician supposed to get the one year of experience? What better place to get the experience than in a licensed OBOT facility?

MICHAEL TINO, M.D., FASAM, DABAM, DOCTOS ASSISTED WELLNESS & RECOVERY CENTER, LLC: No mention of Newly Data Waivered Physicians. Need criteria and allowance for a year. All listings for physicians show 1 year experience only.

TDMHSAS Response: The Department agrees and has deleted the requirement for program physicians to have one (1) year of documented experience in the treatment of persons addicted to alcohol or other drugs.

0940-05-35-.19(3)(e)

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: Is this necessary? All licensed professionals work under the scope of their applicable professional practice act.

Recommendation: Eliminate (e). Federal regulation makes (e) unnecessary, and Occam's Razor suggest that

regulation is more effective if powerful, clear, and direct.

TDMHSAS Response: The Department agrees and has deleted 0940-05-35-.19(3)(e).

0940-05-35-.19(3)(f)

WILLIAM CONWAY, M.D., M.B.A., FACP, FASAM, ADDICTION MEDICINE OF TENNESSEE: Requiring one year of direct experience of those who are working under direct supervision will eliminate intelligent capable new therapist from entering the field.

Recommendation: Please eliminate this sentence: Those individuals operating under the direct supervision of a Qualified Provider must have at least one year of prior experience in the field of opioid use disorder treatment before assuming this position.

TDMHSAS Response: The Department agrees and has deleted the last sentence of 0940-05-35-.19(3)(f).

EXHIBITS

- Exhibit A: Conway Attachment 1*
- Exhibit B: Conway Letter*
- Exhibit C: Dr. Smyth Attachment 1*
- Exhibit D: PATAT PAC Attachment 1*
- Exhibit E: PATAT PAC Attachment 2*
- Exhibit F: PATAT PAC Attachment 3*
- Exhibit G: PATAT PAC Attachment 4*
- Exhibit H: PATAT PAC Attachment 5*
- Exhibit I: PATAT PAC Attachment 6*
- Exhibit J: PATAT PAC Attachment 7*
- Exhibit K: PATAT PAC Attachment 8*
- Exhibit L: PATAT PAC Attachment 9*
- Exhibit M: PATAT PAC Attachment 10*
- Exhibit N: PATAT PAC Attachment 11*
- Exhibit O: TADCP Attachment 1*
- Exhibit P: TADCP Attachment 2*

Regulatory Flexibility Addendum

Pursuant to T.C.A. §§ 4-5-401 through 4-5-404, prior to initiating the rule making process, all agencies shall conduct a review of whether a proposed rule or rule affects small business.

The agency shall consider, but not be limited to, each of the following methods of reducing the impact of the proposed rule on small businesses while remaining consistent with health, safety, and well-being:

(1) The extent to which the rule may overlap, duplicate, or conflict with other federal, state, and local governmental rules.

The proposed rules have been written to conform to state and federal rules and to incorporate best practices for the treatment of individuals at an office-based opiate treatment facility.

(2) Clarity, conciseness, and lack of ambiguity in the rule.

The proposed rules exhibit clarity, conciseness, and lack of ambiguity. As is indicated in the comments section, TDMHSAS made changes suggested by stakeholders participating in the rulemaking process to improve rule clarity and conciseness.

(3) The establishment of flexible compliance and reporting requirements for small businesses.

The proposed rules do not establish flexible compliance or reporting requirements for small businesses because the main goal of TDMHSAS's licensure function is to safeguard the health, safety, and well-being of all individuals served by a TDMHSAS licensed provider. However, these proposed rules were written utilizing input from small businesses, including a committee of experts that included several practicing addiction medicine physicians (T.C.A. 4-5-205(c)), and in a way so as not to be overly burdensome to licensed providers.

(4) The establishment of friendly schedules or deadlines for compliance and reporting requirements for small businesses.

The proposed rules do not establish friendly schedules or deadlines for compliance and reporting requirements for small businesses because the main goal of TDMHSAS's licensure function is to safeguard the health, safety and well-being of all individuals served by a TDMHSAS licensed provider. However, these proposed rules were written utilizing input from small businesses, including a committee of experts that included several practicing addiction medicine physicians (T.C.A. 4-5-205(c)) and in a way so as to acknowledge the everyday business obligations of all licensed providers and provide for a common sense approach to compliance and reporting.

(5) The consolidation or simplification of compliance or reporting requirements for small businesses.

The proposed rules are written to be clear, simple, and easy to read by all TDMHSAS licensed providers, including small businesses.

(6) The establishment of performance standards for small businesses as opposed to design or operational standards required in the proposed rule.

The proposed rules are designed to address the operational standards necessary to safeguard the health, safety, and well-being of all individuals who receive services at an office-based opiate treatment facility.

(7) The unnecessary creation of entry barriers or other effects that stifle entrepreneurial activity, curb innovation, or increase costs.

The Department worked with various stakeholders, including a committee of experts that included several practicing addiction medicine physicians (T.C.A. 4-5-205(c)), some of which were small business owners, to ensure that the proposed rules do not unnecessarily create any entry barriers or other effects that stifle entrepreneurial activity or curb innovation.

Economic Impact Statement

(1) The type or types of small business and an identification and estimate of the number of small businesses subject to the proposed rule that would bear the cost of, or directly benefit from the proposed rule.

These rules apply to all entities that meet the definition of an office-based opiate treatment facility (see 0940-05-35-.02(2)(a)). TDMHSAS estimates that a significant number of the entities that would be licensed under this proposed rule would qualify as small businesses (fewer than 50 employees).

(2) The projected reporting, recordkeeping and other administrative costs required for compliance with the proposed rule, including the type of professional skills necessary for preparation of the report or record.

The proposed rules do contain reporting requirements (please see 0940-05-35-.16) regarding: correspondence between the licensed provider and various government agencies (Tennessee Department of Health, FDA, DEA, SAMHSA, etc.); reports and information to assist in determining the effectiveness of medication assisted therapy and how that treatment is delivered; information on significant occurrences at the Facility, including death or serious injury or any action taken against the Facility by the DEA, accrediting body or other local, state, or federal agency; responses to citations for violation of these proposed rules or citations from other agencies.

(3) A statement of the probable effect on impacted small businesses and consumers.

The proposed rules will have an impact on small businesses and consumers. The proposed rules create a new licensure category of office-based opiate treatment (OBOT) facility. As stated above, a significant number of the entities that would be licensed under this proposed rule qualify as small businesses (fewer than 50 employees). Although an impact to small businesses cannot be avoided, these proposed rules are written so as to achieve the dual goals of ensuring effective, efficient, and safe delivery of office-based opiate treatment services while limiting the regulatory burden on licensed providers. In order to accomplish these goals, the Department sought the input of a wide-variety of stakeholders, including a committee of experts that included several practicing addiction medicine physicians (T.C.A. 4-5-205(c)), some of which were small business owners, and conducted extensive research on best practices regarding office-based opiate treatment. The proposed rules will increase the quality of care provided to individuals (consumers) who access treatment from a licensed provider.

(4) A description of any less burdensome, less intrusive or less costly alternative methods of achieving the purpose and objectives of the proposed rule that may exist, and to what extent the alternative means might be less burdensome to small business.

The Department believes that these rules represent the least burdensome, least intrusive, and least costly measures necessary to safeguard the health, safety, and well-being of individuals who access treatment from an OBOT.

(5) A comparison of the proposed rule with any federal or state counterparts.

The proposed rules are not in conflict with federal guidelines and regulations governing office-based opiate treatment facilities and compare favorably to similar rules in other states.

(6) Analysis of the effect of the possible exemption of small businesses from all or any part of the requirements contained in the proposed rule.

The main goal of TDMHSAS's licensure function is to safeguard the health, safety, and well-being of all individuals served by a TDMHSAS licensed provider. As stated above, a significant number of the entities licensed under this proposed rule qualify as small businesses (fewer than 50 employees). Therefore, exempting small businesses from all or any part of the requirements contained in the proposed rule would negate the purpose of promulgating licensure rules for this treatment method. The proposed rules were written utilizing input from various stakeholders, including a committee of experts that included several practicing addiction medicine physicians (T.C.A. 4-5-205(c)), some of which were small business owners, and in a way so as to acknowledge the everyday business obligations of all licensed providers and provide for a common sense approach to compliance and reporting. By requiring all OBOT licensees to function under the same standards, the proposed rules ensure that some of Tennessee's most vulnerable citizens are receiving effective, efficient, and standardized care throughout the State.

Impact on Local Governments

Pursuant to T.C.A. §§ 4-5-220 and 4-5-228 "any rule proposed to be promulgated shall state in a simple declarative sentence, without additional comments on the merits of the policy of the rules or regulation, whether the rule or regulation may have a projected impact on local governments." (See Public Chapter Number 1070 (<http://state.tn.us/sos/acts/106/pub/pc1070.pdf>) of the 2010 Session of the General Assembly)

The proposed rules will not have an impact on local governments.

Additional Information Required by Joint Government Operations Committee

All agencies, upon filing a rule, must also submit the following pursuant to T.C.A. § 4-5-226(i)(1).

- (A) A brief summary of the rule and a description of all relevant changes in previous regulations effectuated by such rule;

In light of the prescription drug epidemic confronting Tennessee and therefore the overwhelming need for high quality, safe, effective, and efficient treatment options, the Department, as authorized by Public Chapter 912 of the Public Acts of 2016, has promulgated a new category of licensure rules for office-based opiate treatment (OBOT) facilities, which are defined in 0940-05-35-.02(2)(a) of the proposed rules. The proposed rules implement best practices in the area of office-based opiate treatment while ensuring that Tennesseans have continued access to this important treatment option.

The following is a summary of the proposed rules:

**All citations referenced below refer to the version of the rule contained in this Rulemaking Hearing Rule(s) document.*

1. The proposed rules establish several definitions for terms commonly used in the proposed rules (0940-05-35-.02) and clearly set out other rules that are applicable to entities licensed under the proposed rules (0940-05-35-.03).
2. The proposed rules set out licensing procedures for entities applying for licensure under these proposed rules, including, but not limited to, provisions regarding ownership, application for licensure, renewal of licensure, licensure fees, the Department's authority to conduct investigations in order to ensure compliance with the proposed rules, etc. (0940-05-35-.04).
3. The proposed rules clearly set out procedures regarding admission and discharge from an OBOT and requires that these admission and discharge procedures be carried out in accordance with peer reviewed medication assisted treatment guidelines developed by nationally recognized organizations (0940-05-35-.06).
4. The proposed rules clearly set out patient records requirements for OBOTs, including, but not limited to, ensuring patient consent to treatment, ensuring that patients are informed of the OBOT's rules for patient conduct and responsibilities, and ensuring adequate billing and medical record retention and maintenance in accordance with T.C.A. § 33-2-403(e),(f), and (g) (0940-05-35-.07).
5. The proposed rules clearly set out that OBOTs should create individualized treatment plans for their patients and ensure that each individualized treatment plan is created in accordance with peer reviewed medication assisted treatment guidelines developed by nationally recognized organizations. Individualized treatment plans shall address the frequency of random observed drug screens, office visits, and counseling sessions (0940-05-35-.09).
6. The proposed rules clearly set out requirements regarding the treatment of special populations at the OBOTs, including pregnant women and women of child bearing age and potential, patients engaged in pain management, patients living with co-occurring disorders, patients who have engaged, or who are engaging, in polysubstance abuse, and patients who are currently in the criminal justice system (0940-05-35-.10).
7. The proposed rules clearly sets out that counseling is an essential element to medication assisted treatment provided at an OBOT and requires OBOTs to be responsible for determining and documenting that counseling is being received and that their patients are progressing towards meeting the goals listed in their individualized treatment plans (0940-05-35-.11).
8. The proposed rules clearly set out requirements regarding medication management, including prescribing practices, the use of benzodiazepines, checking of the controlled substances monitoring database, the development of guidelines for the review of prescriptions from other providers, etc. (0940-05-35-.12).
9. The proposed rules require OBOTs to use drug screens for the purpose of assessing a patient's abuse of drugs and evaluating the patient's progress in treatment and sets out basic provisions regarding the collection and documentation of those drug screens (0940-05-35-.13).

10. The proposed rules set out clear requirements regarding detoxification and medically supervised withdrawal and the implementation of diversion control plans (0940-05-35-.14 & .15).

11. The proposed rules contain reporting requirements regarding: correspondence between the licensed provider and various government agencies (Tennessee Department of Health, FDA, DEA, SAMHSA, etc.); reports and information to assist in determining the effectiveness of medication assisted therapy and how that treatment is delivered; information on significant occurrences at the Facility, including death or serious injury or any action taken against the Facility by the DEA, accrediting body or other local, state, or federal agency; responses to citations for violation of the proposed rules or citations from other agencies (0940-05-35-.16).

12. The proposed rules clearly provide for the establishment of patient rights at an OBOT (0940-05-35-.17).

13. The proposed rules clearly set out requirements regarding community relations between OBOTs and the communities in which they are located and require documentation of community relation efforts and community contacts (0940-05-35-.18).

14. The proposed rules clearly set out personnel and staffing requirements for OBOTs, including standard qualifications for an OBOT's medical director, facility director, program physicians, and other qualified providers (0940-05-35-.19).

(B) A citation to and brief description of any federal law or regulation or any state law or regulation mandating promulgation of such rule or establishing guidelines relevant thereto;

T.C.A. § 4-3-1601(b) provides the following as a general function of the Department: "... set standards for, ... monitor, and promote the ... provision of services and supports to meet the needs of persons with mental illness or serious emotional disturbance through the public and private sectors in this state as set out in ... title 33". Additionally, TCA § 33-1-305, gives the Department authority to adopt rules, prescribe forms and investigate complaints; TCA §33-2-403, grants the Departments (TDMHSAS & DIDD) the authority to license services and facilities operated for the provision of mental health services, alcohol and drug abuse prevention or treatment, for the provision of services for intellectual and developmental disabilities, and for personal support services; and Tennessee Chapter 912 of Public Acts of 2016 authorizes the Department to promulgate rules regarding OBOTs.

(C) Identification of persons, organizations, corporations or governmental entities most directly affected by this rule, and whether those persons, organizations, corporations or governmental entities urge adoption or rejection of this rule;

Pursuant to State of Tennessee Chapter 912 of the Public Acts of 2016, the entities that will be most directly impacted by these rules are service entities that include, but are not limited to, stand-alone clinics, treatment resources, individual physical locations occupied as the professional practice of a prescriber or prescribers licensed pursuant to Title 63, or other entities prescribing products containing buprenorphine, or products containing any other controlled substance designed to treat opioid use disorder by preventing symptoms of withdrawal to fifty percent (50%) or more of its patients and one hundred fifty (150) or more patients. The Department received several comments from various groups regarding the proposed rules. The Department provided response to all comments received. The Department is aware of one individual who submitted comments urging the rejection of an earlier draft version of the proposed rules filed with the Notice of Rulemaking Hearing document. The Department is unaware as to whether that individual still urges rejection of the proposed rules. Alternatively, the Department is also aware of several stakeholders who have urged adoption of the proposed rules.

(D) Identification of any opinions of the attorney general and reporter or any judicial ruling that directly relates to the rule or the necessity to promulgate the rule;

None.

(E) An estimate of the probable increase or decrease in state and local government revenues and expenditures, if any, resulting from the promulgation of this rule, and assumptions and reasoning upon which the estimate is based. An agency shall not state that the fiscal impact is minimal if the fiscal impact is more than two

percent (2%) of the agency's annual budget or five hundred thousand dollars (\$500,000), whichever is less;

There is minimal estimated fiscal impact to State or local governments due to the promulgation of the proposed rules.

- (F) Identification of the appropriate agency representative or representatives, possessing substantial knowledge and understanding of the rule;

Kurt Hippel
TDMHSAS
Director of Legislation and Rules

Cindy Tyler
TDMHSAS
Assistant Commissioner, Division of Administrative and Regulatory Services

Dr. Stephen Loyd
TDMHSAS
Medical Director for Substance Abuse Services

- (G) Identification of the appropriate agency representative or representatives who will explain the rule at a scheduled meeting of the committees;

Kurt Hippel
TDMHSAS
Director of Legislation and Rules

Cindy Tyler
TDMHSAS
Assistant Commissioner, Division of Administrative and Regulatory Services

Dr. Stephen Loyd
TDMHSAS
Medical Director for Substance Abuse Services

- (H) Office address, telephone number, and email address of the agency representative or representatives who will explain the rule at a scheduled meeting of the committees; and

Kurt Hippel
TDMHSAS
Director of Legislation and Rules
500 Deaderick Street, 5th Floor
Nashville, TN 37243
(615) 532-9439
Kurt.Hippel@tn.gov

Cindy Tyler
TDMHSAS
Assistant Commissioner, Division of Administrative and Regulatory Services
500 Deaderick Street, 6th Floor
Nashville, TN 37243
(615) 532-6586
Cynthia.Tyler@tn.gov

Dr. Stephen Loyd
TDMHSAS
Medical Director for Substance Abuse Services

500 Deaderick Street, 6th Floor
Nashville, TN 37243
(615) 532-1225
Stephen.Loyd@tn.gov

(I) Any additional information relevant to the rule proposed for continuation that the committee requests.

None

Department of State
 Division of Publications
 312 Rosa L. Parks Avenue, 8th Floor Snodgrass/TN Tower
 Nashville, TN 37243
 Phone: 615-741-2650
 Email: publications.information@tn.gov

For Department of State Use Only

Sequence Number: 10-08-16
 Rule ID(s): 6335
 File Date: 10/14/16
 Effective Date: 1/12/17

Rulemaking Hearing Rule(s) Filing Form

Rulemaking Hearing Rules are rules filed after and as a result of a rulemaking hearing (Tenn. Code Ann. § 4-5-205).

Pursuant to Tenn. Code Ann. § 4-5-229, any new fee or fee increase promulgated by state agency rule shall take effect on July 1, following the expiration of the ninety (90) day period as provided in § 4-5-207. This section shall not apply to rules that implement new fees or fee increases that are promulgated as emergency rules pursuant to § 4-5-208(a) and to subsequent rules that make permanent such emergency rules, as amended during the rulemaking process. In addition, this section shall not apply to state agencies that did not, during the preceding two (2) fiscal years, collect fees in an amount sufficient to pay the cost of operating the board, commission or entity in accordance with § 4-29-121(b).

Agency/Board/Commission:	Tennessee Department of Mental Health & Substance Abuse Services
Division:	Division of Administrative and Regulatory Services
Contact Person:	Kurt Hippel
Address:	5 th Floor, Andrew Jackson Building, 500 Deaderick Street, Nashville, TN
Zip:	37243
Phone:	615-532-6520
Email:	Kurt.Hippel@tn.gov

Revision Type (check all that apply):

- Amendment
 New
 Repeal

Rule(s) (ALL chapters and rules contained in filing must be listed here. If needed, copy and paste additional tables to accommodate multiple chapters. Please make sure that ALL new rule and repealed rule numbers are listed in the chart below. Please enter only ONE Rule Number/Rule Title per row)

Chapter Number	Chapter Title
0940-05-35	Minimum Program Requirements for Nonresidential Office-Based Opiate Treatment Facilities
Rule Number	Rule Title
0940-05-35-.01	Purpose
0940-05-35-.02	Definitions
0940-05-35-.03	Application of the Rules
0940-05-35-.04	Licensing Procedures
0940-05-35-.05	Policy and Procedures
0940-05-35-.06	Admissions and Discharges and Best Practices Utilized
0940-05-35-.07	Patient Record Requirements
0940-05-35-.08	Patient Transfers
0940-05-35-.09	Individualized Treatment Plan and Best Practices Utilized
0940-05-35-.10	Special Populations
0940-05-35-.11	Counseling
0940-05-35-.12	Medication Management
0940-05-35-.13	Drug Screens
0940-05-35-.14	Detoxification and Medically Supervised Withdrawal
0940-05-35-.15	Diversion Control Plan

0940-05-35-.16	Reporting Requirements
0940-05-35-.17	Patient Rights
0940-05-35-.18	Community Relations
0940-05-35-.19	Personnel and Staffing Requirements

(Place substance of rules and other info here. Please be sure to include a detailed explanation of the changes being made to the listed rule(s). Statutory authority must be given for each rule change. For information on formatting rules go to http://sos.tn.gov/sites/default/files/forms/Rulemaking_Guidelines_August2014.pdf)

0940-05-35-.01 Purpose.

The rules in this chapter implement the law relative to licensure and regulation of nonresidential office-based opiate treatment facilities pursuant to Chapter 912 of the Public Acts of 2016.

Authority: T.C.A. §§ 4-3-1601, 4-4-103, 33-1-302, 33-1-305, 33-1-309, 33-2-301, 33-2-302, 33-2-402, 33-2-403, 33-2-404, 33-2-407, and Chapter 912 of the Public Acts of 2016.

0940-05-35-.02 Definitions.

- (1) Definitions of general terms used in these rules can be found in Rules Chapter 0940-05-01.
- (2) Definitions specific to this chapter are as follows:
 - (a) "Nonresidential office-based opiate treatment facility" or "Facility" or "OBOT" is a service entity that includes, but is not limited to, stand-alone clinics, treatment resources, individual physical locations occupied as the professional practice of a prescriber or prescribers licensed pursuant to Title 63, or other entities prescribing products containing buprenorphine, or products containing any other controlled substance designed to treat opioid use disorder by preventing symptoms of withdrawal to fifty percent (50%) or more of its patients and to one hundred fifty (150) or more patients.
 - (b) "Buprenorphine" means a semi-synthetic opioid partial agonist that activates the opioid receptors but not to the same degree as full agonists such as morphine and heroin.
 - (c) "Case Management/Care Coordination" means a collaborative process of assessment, planning, facilitation, care coordination, evaluation, and advocacy for options and services to meet an individual's and family's comprehensive health needs through communication and available resources to promote quality, cost-effective outcomes.
 - (d) "Controlled Substance Monitoring Database" or "CSMD" means a program administered by the Tennessee Department of Health to monitor the prescribing and dispensing of Schedule II, III, IV and V controlled substances as set forth by T.C.A. Title 53, Chapter 10, Part 3.
 - (e) "Counseling" or "Counseling Session" means a face-to-face individual therapeutic counseling session lasting not less than twenty (20) minutes with a qualified provider, or a group educational session of no more than twenty (20) patients and lasting not less than fifty (50) minutes facilitated by a qualified provider. Counseling shall be focused on issues related to the patient's opioid use disorder and shall not include discussions related to administrative procedures. Telehealth, pursuant to the Tennessee Code Annotated, may be utilized to facilitate counseling. Attendance of a 12-step program, such as Narcotics Anonymous, shall not be considered counseling. The Facility shall document each counseling session in the patient's medical chart.
 - (f) "DATA 2000 Waiver" means the registered authority given to a qualified health care professional by the U.S. Drug Enforcement Administration to prescribe FDA-approved narcotic medication for opioid detoxification or maintenance treatment pursuant to 21 U.S.C. §823(g).
 - (g) "DEA" means the United States Drug Enforcement Administration.
 - (h) "Detoxification" or "Detoxification Treatment" means the dispensing of an opioid agonist treatment medication in decreasing doses to the patient to alleviate adverse physical or psychological effects incident to withdrawal from the continuous or substantial use of an opioid drug and as a method of bringing the patient to a drug-free state within that period.

- (i) "Diversion Control Plan" means specific measures, including assigning responsibilities to medical and administrative staff, to reduce the possibility of diversion of controlled substances from legitimate treatment to illicit use.
- (j) "Facility Director" means the person designated by the Facility's governing body who is responsible for the operation of the Facility, for the overall compliance with federal, state, and local laws and regulations regarding the operation of a non-residential office-based opiate treatment facility, and for all Facility employees. Non-physician facility directors shall not supervise medical staff.
- (k) "FDA" means the United States Food and Drug Administration.
- (l) "Governing Body" means the person or persons with primary legal authority and responsibility for the overall operation of the OBOT and to whom a director/chief executive officer is responsible. Depending upon the organizational structure, this body may be an owner or owners; a board of directors or other governing members of the licensee; or state, city, or county officials appointed by the licensee.
- (m) "Inspection" means any examination by the Department or its representatives of an OBOT including, but not limited to, the premises, staff, persons in care, and documents pertinent to initial and continued licensing, so that the Department may determine whether an OBOT is operating in compliance with licensing requirements or has violated any licensing requirements. The term inspection includes any survey, monitoring visit, complaint investigation, or other inquiry conducted for the purposes of making a compliance determination with respect to licensing requirements.
- (n) "Medical Director" means a physician who meets the qualifications set out in 0940-05-35-.19(3)(b) and who has been designated by the governing body of the Facility to be responsible for the supervision of all medical staff at the Facility and the administration of all medical services offered by the Facility, including compliance with all federal, state and local laws and rules regarding medical treatment of opioid use disorder.
- (o) "Medical Record" or "Medical Chart" means medical histories, records, reports, summaries, diagnoses, prognoses, records of treatment and medication ordered and given, entries, x-rays, radiology interpretations and other written electronics, or graphic data prepared, kept, made or maintained in a facility that pertains to services rendered to patients.
- (p) "Medication Assisted Treatment" means use of a medication approved by FDA, in combination with counseling and behavioral therapies, for the treatment of an opioid use disorder.
- (q) "Multidisciplinary Treatment Team" or "Treatment Team" means professionals, which may include a licensed physician, licensed physician assistant, licensed nurse, qualified alcohol and drug treatment personnel, and/or mental health professionals, who assess, evaluate, or treat a patient.
- (r) "Office of Licensure" means the Tennessee Department of Mental Health and Substance Abuse Services (TDMHSAS) Office of Licensure.
- (s) "Opiate/Opioid" means a drug that contains opium, derivatives of opium, or any of several semi-synthetic or synthetic drugs with agonist activity at the opioid receptor.
- (t) "Observed Drug Screen" or "Observed Urine Drug Screening" means a test used to determine the presence of illicit drugs in an individual's body conducted by and in the presence of a Facility medical or lab staff or contracted medical or lab staff so as to ensure against the tampering with or falsification of the results.

- (u) "Patient" or "Service Recipient" shall refer to an individual receiving treatment for opioid use disorder at an OBOT.
- (v) "Physical Location" means real property on which is located a physical structure, whether or not that structure is attached to real property, containing one (1) or more units and includes an individual apartment, office, condominium, cooperative unit, mobile or manufactured home, or trailer, if used as a site for prescribing or dispensing products containing buprenorphine, or products containing any other controlled substance designed to treat opioid use disorder by preventing symptoms of withdrawal.
- (w) "Phases of Treatment" means the induction, stabilization, and maintenance phases associated with office-based opioid treatment as described in the Clinical Guidelines for the Use of Buprenorphine in the Treatment of Opioid Addiction: A Treatment Intervention Protocol published by the Substance Abuse and Mental Health Services Administration's (SAMHSA) Center for Substance Abuse Treatment (CSAT).
- (x) "Program Physician" means any physician, including the medical director, who provides medical services to patients at the Facility.
- (y) "Qualified Provider" means a qualified mental health professional as defined in T.C.A. §33-1-101(20), qualified alcohol and drug abuse treatment personnel as defined in 0940-05-01-.16(7), or treatment staff operating under the direct supervision of either a qualified mental health professional or qualified alcohol and drug abuse treatment personnel.
- (z) "Relapse" means a process in which an individual who has established abstinence or sobriety experiences a recurrence of signs and symptoms of active addiction, often including resumption of the pathological pursuit of reward and/or relief through the use of substances and other behaviors.
- (aa) "TDMHSAS" or "Department" means the Tennessee Department of Mental Health and Substance Abuse Services.
- (bb) "Treatment" or "Substance Abuse Treatment" means a broad range of services intended to assess status, reduce symptoms, or mitigate the effects of substance misuse, substance use disorders, or co-occurring disorders; reduce risk of relapse and associated harm; or restore or establish well-being for individuals and families; provided, that said practice may include, but not be limited to, care coordination, case management, medical, pharmacological, psychological, psycho-educational, rehabilitative or social services and therapies. The overall goals are to eliminate the substance abuse as a contributing factor to physical, psychological, and social dysfunction and to arrest or reverse the progress of any associated problems.
- (cc) "Treatment program" or "Substance Abuse Treatment Program" means an organized system of services containing a mission, philosophy, and model of substance use disorder treatment designed to address the needs of clients.

Authority: T.C.A. §§ 4-3-1601, 4-4-103, 33-1-302, 33-1-305, 33-1-309, 33-2-301, 33-2-302, 33-2-402, 33-2-403, 33-2-404, 33-2-407, and Chapter 912 of the Public Acts of 2016.

0940-05-35-.03 Application of Rules.

- (1) The licensee of an OBOT shall comply with the following rules:
 - (a) Chapter 0940-05-02 Licensure Administration and Procedures;
 - (b) Applicable Minimum Program Requirements for All Services and Facilities found in Chapter 0940-05-06; and
 - (c) Chapter 0940-05-35 Minimum Program Requirements for Nonresidential Office-Based Opiate Treatment Facilities.

- (2) If any provision of these rules, or the application thereof to any person or circumstance, is held invalid, such invalidity shall not affect other provisions or applications of these rules which can be given effect without the invalid provision or application, and to that end the provisions of these rules are declared severable.

Authority: T.C.A. §§ 4-3-1601, 4-4-103, 33-1-302, 33-1-305, 33-1-309, 33-2-301, 33-2-302, 33-2-402, 33-2-403, 33-2-404, 33-2-407, and Chapter 912 of the Public Acts of 2016.

0940-05-35-.04 Licensing Procedures.

- (1) An OBOT, as defined in 0940-05-35-.02(2)(a) and T.C.A. § 33-2-402, shall be licensed by the Tennessee Department of Mental Health and Substance Abuse Services (TDMHSAS or Department).
- (2) An OBOT shall include, as part of its ownership structure, a physician who holds an unrestricted license from the Tennessee Board of Medical Examiners or the Tennessee Board of Osteopathic Examination and holds an active DATA 2000 waiver. "Ownership Structure" means any entity, group, or individual(s) having legal ownership of the OBOT, directing its functions and operations. This includes, but is not limited to, a sole proprietor, general partner, board member of a non-profit or for-profit corporation, or managing member of a limited liability company. Final determination as to whether ownership structure requirements for an OBOT are being met is in the sole discretion of the Department.
- (3) A public benefit non-profit/charitable corporation, registered with the Tennessee Secretary of State, shall have the Facility's medical director on its Board of Trustees.
- (4) A corporate entity doing business as an OBOT in the State of Tennessee shall not provide, hold itself out as providing, or advertise that it provides substance use disorder treatment for opioid use disorder in the form of opioid agonist therapy, or office-based opiate treatment, unless it complies with the following requirements:
- (a) Is appropriately registered with the Tennessee Secretary of State to operate in the State of Tennessee and/or is and remains current with corporate or non-profit/charitable registration requirements of the Tennessee Secretary of State; and,
- (b) Includes, as a member of its Board of Trustees, the Facility's medical director.
- (5) The OBOT shall make application with the Department's Office of Licensure by providing the following information, at a minimum:
- (a) Application on the Office of Licensure's designated forms to include the:
1. Initial Application;
 2. Fact Sheet; and,
 3. Financial Statement;
- (b) Applicable fees as defined in Tennessee Administrative Procedures Rule 0940-05-02-.05;
- (c) Evidence of a contracted and/or currently employed physician with a DATA 2000 waiver;
- (d) Evidence of all physicians contracted and/or currently employed at the Facility holding a license from the Tennessee Board of Medical Examiners or the Tennessee Board of Osteopathic Examination;

- (e) Comprehensive listing of all members of the organization's ownership structure; and
 - (f) Any other item the Department believes is necessary and proper for application purposes.
- (6) Prior to renewal of the license, the OBOT shall be required to formulate policies and procedures that substantially comply with the provisions of this Rule, as well as with Administrative Chapter 0940-05-06.
- (7) The Department may release to and/or gather information from the Tennessee Department of Health Board of Medical Examiners (BME) as is necessary for licensing and/or investigation of complaints against an OBOT.
- (8) With or without notice, the Department, or its representatives, shall have the right to enter upon or into the premises of an OBOT in order to make inspections and/or investigations deemed necessary to determine compliance with applicable law. The OBOT shall comply with all reasonable requests of the Department and allow it to obtain information from third parties as is necessary.
- (9) The Department shall be given the authority to enter upon the premises of an unlicensed facility prescribing buprenorphine-type products to better determine that unlicensed facility's need for TDMHSAS oversight. The Department shall attempt to conduct inspections and investigations in the least intrusive manner needed in order to obtain necessary information. The facility shall be required to provide reasonable amounts of information to the Department for this determination.
- (a) "Reasonable amounts of information," in this context, may be considered aggregate, non-patient identifying information to include, but not be limited to:
 - 1. Patient de-identified identifiers;
 - 2. Lists of medications prescribed to that de-identified patient; and
 - 3. The total number of patients seen at the physical location in question.
- (10) The governing body of an OBOT shall designate a facility director (as defined in 0940-05-35-.02(2)(j)), who is responsible for the operation of the Facility. Non-physician facility directors shall not supervise medical staff.
- (a) Should a Facility operate in such a fashion that the physicians working at the same physical location are unassociated and/or unaffiliated to one another in some type of business arrangement, then the unassociated and/or unrelated physicians shall designate a facility director.

Authority: T.C.A. §§ 4-3-1601, 4-4-103, 33-1-302, 33-1-305, 33-1-309, 33-2-301, 33-2-302, 33-2-402, 33-2-403, 33-2-404, 33-2-407, and Chapter 912 of the Public Acts of 2016.

0940-05-35-.05 Policy and Procedures.

- (1) The governing body of the Facility shall ensure the OBOT is administered and operated in accordance with written policies and procedures in the below listed subject areas and in accordance with these rules. Each Facility shall clearly identify the governing body, as defined in

Rule 0940-05-01-.01(18) and Rule 0940-05-35-.02(2)(l), in its policies and procedures manual including the name and contact information of the governing body.

- (a) Admissions and Discharges and Best Practices Utilized (0940-05-35-.06);
- (b) Patient Record Requirements (0940-05-35-.07);
- (c) Patient Transfers (0940-05-35-.08);
- (d) Individualized Treatment Plan and Best Practices Utilized (0940-05-35-.09);
- (e) Special Populations (0940-05-35-.10);
- (f) Counseling (0940-05-35-.11);
- (g) Medication Management (0940-05-35-.12);
- (h) Drug Screens (0940-05-35-.13);
- (i) Detoxification and Medically Supervised Withdrawal (0940-05-35-.14);
- (j) Diversion Control Plan (0940-05-35-.15);
- (k) Reporting Requirements (0940-05-35-.16);
- (l) Patient Rights (0940-05-35-.17);
- (m) Community Relations (0940-05-35-.18); and
- (n) Personnel and Staffing Requirements (0940-05-35-.19).

Authority: T.C.A. §§ 4-3-1601, 4-4-103, 33-1-302, 33-1-305, 33-1-309, 33-2-301, 33-2-302, 33-2-402, 33-2-403, 33-2-404, 33-2-407, and Chapter 912 of the Public Acts of 2016.

0940-05-35-.06 Admissions and Discharges and Best Practices Utilized.

- (1) Initial Screening. Prior to admission to the Facility, each prospective patient shall be evaluated by the medical director or program physician and clinical staff who have been determined to be qualified by education, training, and experience to perform or coordinate the provision of such assessments. The purpose of such assessments shall be to determine, and document, whether the patient meets the diagnostic criteria for an opioid use disorder as defined in the most recent version of the Diagnostic and Statistical Manual of Mental Disorders (DSM) and whether the Facility will be the most appropriate treatment modality for the patient. No prospective patient shall be processed for admission until it has been verified that the patient meets all applicable criteria.
 - (a) The Facility shall use either standardized assessment and evaluation tools that have been peer reviewed and validated or standardized assessment and evaluation tools as approved by the Department. Examples include American Society of Addiction Medicine (ASAM) placement criteria, the Addiction Severity Index, SAMHSA's TIP 40, or any other assessment and evaluation tools approved by the Department.
- (2) Prior to receiving treatment at the Facility, the patient shall acknowledge in writing having received education on the following:

- (a) Treatment options, including detoxification, and the benefits and risks associated with each treatment option;
 - (b) The risk of neonatal abstinence syndrome and use of voluntary long-acting reversible contraception for all female patients of child bearing age and potential;
 - (c) Prevention and treatment of chronic viral illnesses, such as HIV and hepatitis C;
 - (d) Expected therapeutic benefits and adverse effects of treatment medication;
 - (e) Risks for overdose, including drug interactions with CNS depressants, such as alcohol and benzodiazepines, and relapsing after periods of abstinence from opioids; and
 - (f) Overdose prevention and reversal agents.
- (3) A Facility shall only admit and retain patients whose known needs can be met by the Facility in accordance with its licensed program purpose and description and applicable federal and state statutes, laws, and regulations.
- (4) Drug dependent pregnant females shall be given priority for admission and services.
- (5) No Facility shall provide a bounty or other reward to a third party for referral of potential patients to the clinic.
- (6) Comprehensive Assessment. Within thirty (30) days of admission, the Facility shall have completed a comprehensive assessment in accordance with peer reviewed medication assisted treatment guidelines, developed by nationally recognized organizations, such as SAMHSA and the American Society of Addiction Medicine. The comprehensive assessment shall be attached to the patient's medical chart no later than five (5) days after it is developed. It shall reflect that detoxification is an option for treatment and supported by the Facility's program and has been discussed with the patient. It shall also integrate information obtained in the initial screening. If necessary, the Facility shall obtain complete medical records from other providers with patient's written consent.
- (7) Discharge and Aftercare Plans. A Facility shall complete an individualized discharge and aftercare plan for patients who complete their course of treatment.
- (a) All discharge and aftercare plans shall include documentation that the Facility's counseling and/or medical staff has discussed with the patient an individualized medically supervised withdrawal plan appropriate to the patient.
 - (b) The patient's discharge planning shall include the development of a menu of appropriate treatment resources available to the patient in his or her community. This menu shall be developed in consultation with the patient and shall be in writing and made available to the patient upon discharge. The Facility shall assist the patient in obtaining the appropriate referrals, as necessary.
 - (c) The discharge plan shall be completed at the time of the patient's discharge by the person who has primary responsibility for coordinating or providing for the care of the service recipient. It shall include a final assessment of the patient's status at the time of discharge and aftercare planning. If applicable, parents or guardian, or responsible persons may participate in discharge and aftercare planning. The reason for any patient not participating in discharge and aftercare planning shall be documented in the patient's record.
- (8) The Facility shall document when a patient discontinues services at an OBOT. Determination of the events that constitute a patient's discontinuation of services at an OBOT shall be at the OBOT's discretion.

0940-05-35-.07 Patient Record Requirements.

- (1) Each Facility shall have a specific policy and procedure outlining the Facility's duties and responsibilities regarding any service recipient record requirements that are listed herein and in the minimum requirements of Chapter 0940-05-06.
- (2) Facilities shall organize and coordinate patient medical and billing records in a manner which demonstrates that all pertinent patient information is accessible to all appropriate staff and to TDMHSAS surveyors.
 - (a) Should the licensee plan to close its operations, written notice shall be given to the patient or the new provider prior to the planned closure of the Facility. Patient records shall be transferred to the patient or to the new provider within ten (10) business days of the last scheduled visit of the patient.
- (3) The Facility shall ensure that adequate billing and medical records are maintained in accordance with T.C.A. § 33-2-403(e), (f), and (g).
- (4) Except as otherwise authorized by law, no person shall be admitted for treatment without written consent from the patient and, if applicable, parent, guardian, or responsible party. A documented, voluntary, written, program-specific informed consent to treatment from each patient at admission shall include:
 - (a) Information about all treatment procedures, services, and other policies and regulation throughout the course of treatment, including clinic charges in the form of a fee agreement signed by the patient.
 1. This fee agreement shall include an explanation of the financial aspects of treatment and the consequences of nonpayment of required fees, including the procedures for the patient (or patient's legal representative) in the event they are unable to pay for treatment;
 - (b) Consent to the individualized, prescribed therapy before dosing begins, including information about potential interactions with and adverse reactions to other substances, including those reactions that might result from interactions and adverse reactions to alcohol, other prescribed or over-the-counter pharmacological agents, other medical procedures and food;
 - (c) Information to each patient that the goal of opioid treatment is stabilization of functioning;
 - (d) Acknowledgement that the patient has been informed of the Facility's rules regarding patient conduct and responsibilities;
 - (e) Acknowledgement that the patient has been informed of his or her rights as found in 0940-05-35-.17;
 - (f) Information that at regular intervals, in full consultation with the patient, the program shall discuss the patient's present level of functioning, course of treatment, and future goals; and
 - (g) Information that the patient may choose to withdraw from or be maintained on the medication as he or she desires unless medically contraindicated.
- (5) The patient's medical chart shall also include documentation of the following:

- (a) Documentation that the patient's initial screening and comprehensive assessment are completed and documented in the patient's medical record prior to the development of the patient's individualized treatment plan;
- (b) The individualized treatment plan, including any reviews, changes or amendments to the plan;
- (c) Documentation that services listed in the individualized treatment plan are available and have been provided or offered;
- (d) A record of correspondence with the patient, family members, and other individuals and a record of each referral for services and its results;
- (e) A discharge and aftercare plan pursuant to 0940-05-35-.06(7), including reasons for discharge and any referral. In the case of death, the reported cause of death shall be documented; and
- (f) Documentation of coordination of care should be present in those clinical situations which require consultations or coordination of care.

Authority: T.C.A. §§ 4-3-1601, 4-4-103, 33-1-302, 33-1-305, 33-1-309, 33-2-301, 33-2-302, 33-2-402, 33-2-403, 33-2-404, 33-2-407, and Chapter 912 of the Public Acts of 2016.

0940-05-35-.08 Patient Transfers.

- (1) If a prospective patient has previously been discharged from treatment at another Facility or other type of treatment program, the admitting Facility, after having the patient sign a release of information, shall initiate an inquiry into the prospective patient's prior treatment history, inquiring of the last Facility or other type of treatment program attended and the reasons for discharge from treatment.

Authority: T.C.A. §§ 4-3-1601, 4-4-103, 33-1-302, 33-1-305, 33-1-309, 33-2-301, 33-2-302, 33-2-402, 33-2-403, 33-2-404, 33-2-407, and Chapter 912 of the Public Acts of 2016.

0940-05-35-.09 Individualized Treatment Plan and Best Practices Utilized.

- (1) The admission requirements of 0940-05-35-.06 shall first be completed prior to the development of an Individualized Treatment Plan (ITP).
- (2) A Facility shall develop an ITP for each patient within thirty (30) days of admission. The ITP shall be developed in accordance with peer reviewed medication assisted treatment guidelines, developed by nationally recognized organizations, such as SAMHSA and the American Society of Addiction Medicine.
- (3) Medical care, including referral for necessary medical service, and evaluation and follow-up of patient complaints, shall be compatible with current and accepted standards of medical practice. All patients shall receive a medical evaluation at least annually and other medical examination or testing shall be considered as appropriate. All other medical procedures performed at the time of admission shall be reviewed by the medical staff on an annual basis, and all clinically indicated tests and procedures shall be repeated. The medical director or program physician shall record the results of this annual medical evaluation and review of patient medical records in each service recipient's record.
- (4) Requirements for services according to phases of treatment:
 - (a) A patient in the induction or stabilization phases of treatment shall:
 - 1. Have weekly office visits scheduled;

2. Receive appropriate counseling sessions at least twice a month;
 3. Be subject to one (1) observed drug screen at least weekly; and
 4. Receive case management services weekly.
- (b) A patient in the maintenance phase of treatment for less than one (1) year shall:
1. Have a scheduled office visit at least every two (2) to four (4) weeks;
 2. Receive counseling sessions at least monthly;
 3. Be subject to a random observed drug screen at least eight (8) times annually; and
 4. Receive case management services at least monthly.
- (c) A patient in the maintenance phase of treatment for one (1) year or more shall:
1. Have a scheduled office visit at least every two (2) months;
 2. Receive counseling sessions at least monthly;
 3. Be subject to a random observed drug screen at least four (4) times annually; and
 4. Receive case management services at least monthly.
- (5) Each Facility shall take steps to ensure that a comprehensive range of rehabilitative services, including vocational, educational, legal, mental health, alcoholism, and social services, are made available to the patients who demonstrate a need for such services. The Facility can fulfill this responsibility by providing support services directly or by appropriate referral. Support services that are recommended and/or utilized shall be documented in the patient's record. Each Facility shall have policies for matching a patient's needs to treatment.
- (6) If the patient experiences a relapse, his or her ITP shall document evidence of intensified services provided. Such evidence may include, but is not limited to, an increase in individual or group counseling session(s) or more frequent drug screens.
- (7) A patient's ITP shall be reviewed at least every six (6) months and a discussion shall be held with the patient regarding his or her continued desire to remain in the program for maintenance treatment. Alternatives such as medically-supervised withdrawal shall be presented to the patient at the time of the discussion and documented in the patient's record. The patient shall sign and date a statement indicating that she or he wishes to remain within the program in a maintenance phase. If the patient wishes to enter medically-supervised withdrawal, the plan of care shall reflect that choice.

Authority: T.C.A. §§ 4-3-1601, 4-4-103, 33-1-302, 33-1-305, 33-1-309, 33-2-301, 33-2-302, 33-2-402, 33-2-403, 33-2-404, 33-2-407, and Chapter 912 of the Public Acts of 2016.

0940-05-35-.10 Special Populations.

- (1) Pregnant Women/Women of Child Bearing Age and Potential. Upon the initial screening, the Facility shall screen all women of child bearing age and potential for pregnancy. The Facility will ensure that pregnant women and women of child bearing age and potential shall be treated using nationally recognized best practice guidelines and within all applicable federal and state rules and regulations. If the Facility does not provide prenatal care to pregnant patients, the Facility shall ensure that there is coordination of care between the Facility and the pregnant patient's prenatal care provider.

- (a) The Facility shall document, in the patient's medical record, that the Facility has informed all pregnant women and women of child bearing age and potential, initially and at regular intervals, of the risks and benefits of the utilization of voluntary, reversible, long-acting contraception, of the risks and benefits of medication assisted treatment and detoxification treatment with buprenorphine containing products, and of the risks associated with the continued use of illicit opioids, including neonatal abstinence syndrome. The information provided to pregnant women and women of child bearing age and potential shall be based on current best practices and research.
- (2) Pain Management. The Facility shall ensure that program physicians are knowledgeable in the management of opioid use disorder in a context of chronic pain and pain management. Individuals being treated with opioids for chronic or acute pain, who have become physically dependent in the course of their medical treatment, should be treated in a medical or surgical setting due to the possibility that this type of patient may need a higher dosage of pain medication to achieve adequate pain control. Individuals who are addicted to opioids, demonstrating drug-seeking behavior, or performing illegal drug-related activity, and who also need treatment for pain may be enrolled in the Facility but the Facility shall ensure continuity of care and communication between treatment programs or physicians regarding patients receiving treatment in both a non-residential office-based opiate treatment facility and a licensed pain management clinic or a pain management specialist's office for purposes of pain management, with patient consent.
- (3) Co-occurring disorders. The Facility shall ensure that patients with mental health needs are identified through the initial screening and comprehensive assessment processes and are referred to appropriate treatment.
 - (a) The Facility shall monitor patients during treatment to identify the emergence of symptoms of mental illness.
 - (b) The Facility shall establish linkages with mental health providers in the community.
- (4) Polysubstance Abuse. The Facility shall address abuse of alcohol and other non-opioid substances within the context of the medication-assisted therapy effort. Ongoing polysubstance abuse is not necessarily a reason for discharge; however, the patient may be offered a referral to more intensive levels of care, to include but not be limited to, intensive outpatient or residential alcohol and drug abuse treatment.
- (5) Criminal Justice. The Department encourages each Facility to work with local law enforcement, probation officers, and courts, including recovery (drug) courts, to act as a resource for individuals in the criminal justice system to receive the necessary treatment services including medications and counseling.

Authority: T.C.A. §§ 4-3-1601, 4-4-103, 33-1-302, 33-1-305, 33-1-309, 33-2-301, 33-2-302, 33-2-402, 33-2-403, 33-2-404, 33-2-407, and Chapter 912 of the Public Acts of 2016.

0940-05-35-.11 Counseling.

- (1) Counseling is essential and the Facility shall determine the best counseling option for each individual patient based upon the patient's history and assessments, agreeance with the patient, and the goals of the patient's individualized treatment plan.
- (2) The Facility shall be responsible to determine and document that counseling is being received and the patient is progressing towards meeting the goals listed in the individualized treatment plan. The Facility shall review and modify the individualized treatment plan if it is determined that a patient is not following through with counseling referrals.
- (3) If the Facility utilizes their own staff to provide counseling:
 - (a) The Facility staff shall be sufficient in number and in training to:

1. Allow the Facility to provide adequate:
 - (i) Psychosocial assessment;
 - (ii) Treatment planning; and
 - (iii) Individualized counseling.
 2. Allow for regularly scheduled counseling sessions; and
 3. Allow patients access to their counselor if more frequent contact is merited by need or is requested by the patient.
- (4) For Facilities referring patients for counseling, the Facility shall provide the patient, with the patient's consent, a list of available licensed treatment providers in the community and assist the patient in receiving these services by offering to make appointments on the patient's behalf and by coordinating care.

Authority: T.C.A. §§ 4-3-1601, 4-4-103, 33-1-302, 33-1-305, 33-1-309, 33-2-301, 33-2-302, 33-2-402, 33-2-403, 33-2-404, 33-2-407, and Chapter 912 of the Public Acts of 2016.

0940-05-35-.12 Medication Management.

- (1) Opioid Drugs. Facilities shall develop and implement written policies and procedures for the prescription of opioid drugs. Any changes to these policies and procedures shall be done in consultation with the Facility's medical director. These policies and procedures shall include the following:
 - (a) Prescribing.
 1. The proper initial dose, medication type, and dosage form shall be based on the clinical judgment of the program physician who has examined the patient and who has considered all available relevant patient-specific information including, but not limited to, drug screens, initial screenings, medication availability and cost, and in consultation with the patient.
 2. No standardized routines or schedules of increases or decreases of medication doses may be established or used.
 3. A copy of all prescriptions written for a patient at the Facility shall be documented in the patient's medical chart.
- (2) CSMD Check. The Facility shall check the CSMD upon every visit of the patient with a program physician. The patient's medical record shall include documentation of the check of the CSMD and the date upon which it occurred.
- (3) Benzodiazepine Use. Benzodiazepines should only be prescribed to a patient after careful evaluation while utilizing caution and good judgement. Benzodiazepines may be prescribed to a patient on buprenorphine or a buprenorphine and naloxone combination under the following conditions:
 - (a) Benzodiazepines may not be initiated with a patient with opioid use disorder or the disease of addiction who has never been prescribed these products or has a history of misusing or abusing these products, except in extreme circumstances for severe anxiety or panic disorder, and only after evaluation by a board certified psychiatrist.
 - (b) Patients who present with a longstanding prescription for benzodiazepines for a legitimate medical condition from another prescriber may be prescribed buprenorphine products by a physician with a DATA 2000 waiver. Contact should be initiated with the

prescriber of the benzodiazepine to coordinate care and clear documentation should be recorded in the patient's medical chart.

- (c) A program physician at an OBOT may assume management of a patient's benzodiazepine prescribing from another physician if the patient is willing to initiate a program of tapering.
- (d) If a patient presents at an OBOT with a dual diagnosis of opioid use disorder and a clear history of benzodiazepine use disorder, the duration and extent of the abuse should be clearly documented in the medical record. A program physician at an OBOT may prescribe a long acting benzodiazepine, such as clonazepam or its equivalent, under the following conditions:
 - 1. A patient may continue on benzodiazepine therapy as medically indicated as long as there is an ongoing effort to taper the patient to the lowest effective dose in order to prevent benzodiazepine withdrawal syndrome and clear documentation of this effort is made in the patient's medical record.
 - (i) Prescribing more than two (2) milligrams of clonazepam or its equivalent twice daily is considered "high dose therapy".
 - (ii) Patients receiving high dose therapy should have justification for the dosing clearly documented in the patient's medical record.
 - (iii) Patients receiving high dose therapy should be tapered as rapidly as possible to two (2) milligrams or less of clonazepam or its equivalent twice daily, and if the taper is unsuccessful, the reason(s) shall be clearly documented in the patient's medical record.
 - (iv) Patients receiving high dose therapy for a period of longer than six (6) weeks shall be managed by a physician who is board certified in addiction medicine or who is board certified or fellowship trained in addiction psychiatry, or by a physician with a DATA 2000 waiver who has obtained a formal consult from a physician who is board certified in addiction medicine or who is board certified or fellowship trained in addiction psychiatry. The formal consult shall be clearly documented in the patient's medical record.
- (4) The Facility shall develop guidelines for review of prescriptions from other providers. These shall include:
 - (a) Procedures to ensure that a patient's prescriptions from outside physicians will be reported to the medical staff and reviewed by the program physician at admission and annually thereafter;
 - (b) Procedures describing the Facility's response when information about prescriptions from outside physicians is not reported to ensure compliance with this rule; and,
 - (c) Documentation of the Facility's efforts to obtain information about prescriptions from outside physicians in the patient's record, if a Facility is unable to acquire information about a patient's prescriptions.

Authority: T.C.A. §§ 4-3-1601, 4-4-103, 33-1-302, 33-1-305, 33-1-309, 33-2-301, 33-2-302, 33-2-402, 33-2-403, 33-2-404, 33-2-407, and Chapter 912 of the Public Acts of 2016.

0940-05-35-.13 Drug Screens.

- (1) Random observed urine drug screening and other adequately tested toxicological procedures shall be used for the purposes of assessing the patient's abuse of drugs and evaluating a patient's progress in treatment.

- (2) Drug screening procedures shall be individualized and shall follow the required drug screen frequency described in 0940-05-35-.09.
- (3) More frequent collection and analysis of drug samples during episodes of relapse or medically-supervised or other types of withdrawal may occur.
- (4) Collection and testing shall be done in a manner that assures that samples collected from patients is unadulterated. Such collection and testing shall include random direct observation that is conducted professionally, ethically, and in a manner which respects service recipients' privacy.
- (5) A positive test is a test that results in the presence of any drug or substances that is illegal or for which the patient cannot provide a valid prescription or any drug or substance prohibited by the Facility. Any refusal to participate in a random drug test assigned by the Facility shall also be considered a positive result.
- (6) The Facility shall document both the results of toxicological tests and the follow-up therapeutic action taken in the patient record.
- (7) Absence of medications prescribed by the Facility for the service recipient shall be considered evidence of possible medication diversion and evaluated by the program physician accordingly.
- (8) Nothing contained in this rule shall preclude any Facility from administering any additional drug tests it determines necessary.

Authority: T.C.A. §§ 4-3-1601, 4-1-103, 33-1-302, 33-1-305, 33-1-309, 33-2-301, 33-2-302, 33-2-402, 33-2-403, 33-2-404, 33-2-407, and Chapter 912 of the Public Acts of 2016.

0940-05-35-.14 Detoxification and Medically Supervised Withdrawal.

- (1) Medically supervised withdrawal occurs as a voluntary and therapeutic withdrawal agreed upon by staff and patient. In some cases, the withdrawal may be initiated against the advice of clinical staff (against medical advice).
 - (a) The Facility shall work with the patient to taper the patient's dose at a rate that is well tolerated by the patient.
 - (b) The Facility may offer supportive treatment including increased counseling sessions or referrals to a self-help group or other counseling provider as appropriate during a medically-supervised withdrawal.
 - (c) The Facility shall make provisions for continuing care (i.e. referral to other community resources for counseling, etc.) for each patient completing care at the Facility and for re-entry to the Facility if relapse occurs or if the patient should reconsider treatment at the Facility.

Authority: T.C.A. §§ 4-3-1601, 4-4-103, 33-1-302, 33-1-305, 33-1-309, 33-2-301, 33-2-302, 33-2-402, 33-2-403, 33-2-404, 33-2-407, and Chapter 912 of the Public Acts of 2016.

0940-05-35-.15 Diversion Control Plan.

- (1) Each Facility shall prepare a Diversion Control Plan that contains specific measures to reduce the possibility of diversion of controlled substances from legitimate medical treatment use and that assigns specific responsibility to the medical and administrative staff of the Facility for carrying out the diversion control functions described in the Diversion Control Plan. These measures may include patient call backs. The Diversion Control Plan shall address, at a minimum, the following scenarios that may indicate diversion:
 - (a) The patient has been reported to be diverting medication.

- (b) The patient's recent drug screen results show an absence of the treatment medication.
- (c) The patient's urine drug screen is identified as not belonging to the patient or is otherwise adulterated.
- (d) Results from the patient's CSMD check demonstrate significant variation from the patient's treatment plan.

Authority: T.C.A. §§ 4-3-1601, 4-4-103, 33-1-302, 33-1-305, 33-1-309, 33-2-301, 33-2-302, 33-2-402, 33-2-403, 33-2-404, 33-2-407, and Chapter 912 of the Public Acts of 2016.

0940-05-35-.16 Reporting Requirements.

- (1) Upon request or inspection, the Facility shall submit the following information to the Department:
 - (a) All reports, forms, and correspondence submitted to or received from the health-related boards of the Tennessee Department of Health, FDA, DEA, SAMHSA or any other applicable federal agencies, or accreditation organizations shall be provided to the Office of Licensure within five (5) business days of sending or receiving such documents.
 - (b) Such reports and information which may be required by the Department to conduct evaluations of medication assisted treatment effectiveness or monitor service delivery.
- (2) The Facility shall report any significant occurrence, as defined in the TDMHSAS Office of Licensure Reportable Incident Form Instructions, to the Office of Licensure. This shall include any unexpected occurrence or accident that results in death or serious injury to a patient or any action taken against the Facility by the DEA, accrediting body, or other state (not to exclude any state related boards and/or commissions), local, or federal agency. Additional reporting requirements may be found in Chapter 0940-05-02-.20.
- (3) The Facility shall be required to respond in writing following the citation of the Office of Licensure or other State entity. The Facility will be given an appropriate amount of time to respond and their response should encapsulate at least the following:
 - (a) The actions implemented to prevent the recurrence of the event;
 - (b) The time frames for the action(s) to be implemented;
 - (c) The person(s) designated to implement and monitor the action(s); and
 - (d) The strategies for the measurements of effectiveness to be established.

Authority: T.C.A. §§ 4-3-1601, 4-4-103, 33-1-302, 33-1-305, 33-1-309, 33-2-301, 33-2-302, 33-2-402, 33-2-403, 33-2-404, 33-2-407, and Chapter 912 of the Public Acts of 2016.

0940-05-35-.17 Patient Rights.

- (1) Patients shall have a right to present complaints, either orally or in writing, and to have their complaints addressed and resolved as appropriate in a timely manner.
- (2) All applications, certificates, records, reports, and all legal documents, petitions and records made or information received pursuant to treatment in a Facility directly or indirectly identifying a patient shall be kept confidential in accordance with T.C.A. § 33-3-103; Health Insurance Portability and Accountability Act of 1996 (HIPAA) regulations at 45 Code of Regulations (CFR) Parts 160 and 164, Subparts A and E; and Confidentiality of Alcohol and Drug Abuse Patient Records regulations at 42 CFR Part 2.
- (3) Patients have the right to a humane treatment environment that affords reasonable protection from harm, exploitation, and coercion.

Authority: T.C.A. §§ 4-3-1601, 4-4-103, 33-1-302, 33-1-305, 33-1-309, 33-2-301, 33-2-302, 33-2-402, 33-2-403, 33-2-404, 33-2-407, and Chapter 912 of the Public Acts of 2016.

0940-05-35-.18 Community Relations.

- (1) The Facility shall have policies and procedures for community relations to include the following:
 - (a) The Facility shall identify Facility personnel who will function as community relations coordinators and define the goals and procedures for the community relations plan.
- (2) A Facility shall be responsible for ensuring that its patients, while on the Facility's premises, do not cause unnecessary disruption to the community or act in a manner that would constitute disorderly conduct or harassment by loitering.
- (3) Each Facility shall provide TDMHSAS, when requested, with a specific plan describing the efforts it will make to avoid disruption of the community by its patients and the actions it will take to assure responsiveness to community needs.
- (4) Each Facility shall document community relations efforts and community contacts, including the resolution of issues identified by community members or patients.

Authority: T.C.A. §§ 4-3-1601, 4-4-103, 33-1-302, 33-1-305, 33-1-309, 33-2-301, 33-2-302, 33-2-402, 33-2-403, 33-2-404, 33-2-407, and Chapter 912 of the Public Acts of 2016.

0940-05-35-.19 Personnel and Staffing Requirements.

- (1) A personnel record for each staff member of a Facility shall include an application for employment and/or resume and a record of any disciplinary action taken. A licensee shall maintain written records for each employee.
- (2) Staffing.
 - (a) Facility Director. The governing body of each Facility shall designate in writing a facility director who is responsible for the operation of the Facility and overall compliance with federal, state and local laws and regulations regarding the operation of non-residential office-based opiate treatment programs, and for all employees at the Facility. However, non-physician facility directors shall not supervise medical staff. Facilities shall notify the TDMHSAS Office of Licensure in writing within ten (10) calendar days whenever there is a change in facility director.
 - (b) Medical Director. The governing body of each Facility shall designate in writing a medical director to be responsible for the supervision of all medical staff at the Facility and the administration of all medical services at the Facility, including compliance with all federal, state, and local laws and regulations regarding the medical treatment of opioid use disorder. The medical director shall be physically present at the Facility the equivalent of twenty-five (25) percent of the time the Facility is open to the public each week. On a monthly basis, the medical director shall review ten (10) percent of the medical charts for patients currently admitted at the Facility and document each chart review. No physician may serve as medical director of more than three (3) Facilities without the prior written approval of the TDMHSAS Office of Licensure.
 - (c) Program Physician. Facilities are required to provide sufficient physician services to provide the medical treatment and oversight necessary to serve patient need. A Program Physician may be the same individual as the Medical Director, should the Facility so choose and all qualification requirements for a medical director are still met.
 - (d) Physician Assistants and Advanced Practice Nurses. Licensed physician assistants and advanced practice nurses with a certificate of fitness with privileges to write and sign prescriptions and/or issue legend drugs may perform any functions under Federal and Tennessee law or regulations.

- (e) Case management/care coordination. Each Facility shall provide case management/care coordination services by a qualified provider.
- (3) Staff Qualifications.
- (a) Staff Training. Prior to working with patients, all staff providing treatment or services shall be oriented in accordance with all applicable administrative rules, reporting requirements, and their individual position responsibilities. All staff shall receive ongoing training and development activities. Record of all staff training activities shall be noted in their personnel record.
 - (b) Medical Director. A medical director shall be licensed to practice medicine or osteopathy in Tennessee, shall maintain an unrestricted license to practice medicine or osteopathy, hold an active DATA 2000 waiver from the DEA, be designated by the OBOT's governing body, and shall have the following experience and/or credentials:
 1. Certification in addiction psychiatry by the American Board of Psychiatry and Neurology or exam eligible in addiction psychiatry and two (2) years of documented experience in the treatment of persons who are addicted to alcohol or other drugs; or
 2. Certification as an addiction medicine specialist by the American Board of Addiction Medicine (ABAM) or exam eligible for certification as an addiction medicine specialist and two (2) years of documented experience in the treatment of persons who are addicted to alcohol or other drugs.
 - (c) Program Physician. A program physician shall be licensed to practice medicine or osteopathy in Tennessee, shall maintain an unrestricted license to practice medicine or osteopathy, and hold an active DATA 2000 waiver from the DEA.
 - (d) Facility Directors. All Facility directors shall have at least one (1) year of supervisory or administrative experience in the field of opioid use disorder treatment.
 - (e) Qualified Provider. A qualified provider shall be duly licensed, certified or registered as required by the State of Tennessee for the profession and shall only perform those duties that are within the scope of their applicable professional practice acts and Tennessee license.
- (4) Employee Drug Screening. Facilities shall implement pre-employment and ongoing random drug screening of all Facility employees.

Authority: T.C.A. §§ 4-3-1601, 4-4-103, 33-1-302, 33-1-305, 33-1-309, 33-2-301, 33-2-302, 33-2-402, 33-2-403, 33-2-404, 33-2-407, and Chapter 912 of the Public Acts of 2016.

* If a roll-call vote was necessary, the vote by the Agency on these rulemaking hearing rules was as follows:

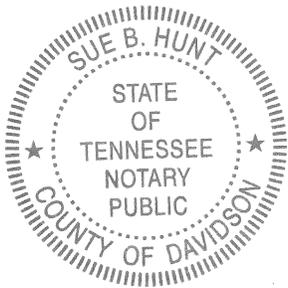
Board Member	Aye	No	Abstain	Absent	Signature (if required)

I certify that this is an accurate and complete copy of rulemaking hearing rules, lawfully promulgated and adopted by the Tennessee Department of Mental Health & Substance Abuse Services (board/commission/ other authority) on 09/26/2016 (mm/dd/yyyy), and is in compliance with the provisions of T.C.A. § 4-5-222.

I further certify the following:

Notice of Rulemaking Hearing filed with the Department of State on: 07/08/2016

Rulemaking Hearing(s) Conducted on: (add more dates). 08/30/2016



Date: Sept. 26, 2016

Signature: [Handwritten Signature]

Name of Officer: E. Douglas Varney

Title of Officer: Commissioner

Subscribed and sworn to before me on: Sept. 26, 2016

Notary Public Signature: Sue B. Hunt

My commission expires on: **My Commission Expires May 8, 2017**

All rulemaking hearing rules provided for herein have been examined by the Attorney General and Reporter of the State of Tennessee and are approved as to legality pursuant to the provisions of the Administrative Procedures Act, Tennessee Code Annotated, Title 4, Chapter 5.

Herbert H. Stutz III
 Herbert H. Stutz III
 Attorney General and Reporter
10/12/2016 Date

Department of State Use Only

RECEIVED
 2016 OCT 14 AM 8:38
 SECRETARY OF STATE
 PUBLICATIONS

Filed with the Department of State on: 10/14/16

Effective on: 1/12/17
[Handwritten Signature]

Tre Hargett
Secretary of State

Five Different Long Run Scenarios for Tennessee's Future in Today's Opioid Epidemic: A Net Present Value Analysis and Future Cumulative Cost of Health Care Costs Which will be Driven by Federal Regulatory Decisions concerning Buprenorphine

Submitted by William F. Conway, MD, MBA, FACP, FASAM and Ann Duane, Ph.D.

May 31, 2016

Table of Contents

Introduction..... 3

Statement of the Issue:.....3

Statement of Relevant Facts Concerning Our Addiction Medicine Group and Our Patients..... 3

 Introduction to Authors.....3

 Introduction to metabolic diseases..... 4

 Introduction to our patients and their world..... 5

Statement of Relevant Facts and Opinions.....5

 Understanding the Effectiveness of Buprenorphine Maintenance Treatment..... 5

 Factors Underlying Supply and Demand for Buprenorphine in Tennessee’s Marketplace..... 6

 Opioid Addiction as a Driver of Crime, Incarceration, and Federally Mandated Health Care Costs in Tennessee..... 7

 Scale of Operation..... 8

 Impact of Scale upon Innovation..... 8

 Avoiding another Chronic Pain Debacle through Enlighten State Regulation, Faith in Board of Medical Examiners, and DEA.....9

 The Importance of the American Board of Addition Medicine..... 9

The Quantitative Analysis.....10

 Acknowledgement of Ann Duane, Ph.D. and Acknowledgment of Limits of Analysis.....10

Scenario Number 1: Financial Contribution of 100 patients on Successful Buprenorphine Maintenance Treatment in West Tennessee..... 10

Scenario Number 2: Financial Contribution of 1000 patients in Tennessee on long term buprenorphine treatment over 10 years if Federal Permission is Granted to Treat..... 11

Scenario Number 3: Cost for 10 years for Non Treatment of 100 patients with IV Heroin Use in Tennessee associated with Current Federal Restrictions on Treatment.....12

Scenario Number 4: Cost for 10 Years for Non Treatment of a Mixture of Patients with Opioid Addiction under Current Federal Restrictions on Buprenorphine Treatment..... 13

Scenario Number 5: The Growth Scenario for Cumulative Cost of One Decade of Non Treatment of 10,000 IV Heroin Users under Current Federal Restrictions on Buprenorphine Treatment: The Non Treatment, The Delay of Treatment, Severe Restriction of Treatment Scenario..... 14

Summary..... 16

Recommendations..... 17

Introduction

HHS has recently released their proposed rule on Medication Assisted Treatment for Opioid Use Disorders.

This regulation will determine whether there is a possibility that long term buprenorphine treatment will be available in the opioid epidemic in Tennessee.

In the authors' opinion, opioid addiction is a metabolic disease in which long term buprenorphine treatment is essential for successful treatment of many patients with advanced, relapsing disease.

Using simple, but realistic assumptions, the impact of this rule on costs of healthcare and incarceration will be modeled in the State of Tennessee.

This analysis adds net present values for financial contribution expected from successful long term buprenorphine treatment.

The quantitative analysis will focus on the long run cost burden on Tennessee produced by non-treatment of opioid addiction resulting federal limitations of number of patients granted federal permission for treatment.

While our presentation of the facts and our quantitative modeling will be entirely objective, this is a document of advocacy. If the future is a straight line extension of the past, this regulation, in our opinion, will be viewed in the future as a historic inflection point, where the critical opportunity to make treatment of patients with opioid addiction was lost.

Statement of the Issue:

Should diplomates of The American Board of Addiction Medicine be considered specialists in the proposed regulation?

What should be the optimal number of prescriptions for buprenorphine per month permitted by federal regulation to be written by specialists?

Statement of Relevant Facts Concerning Our Addiction Medicine Group and Our Patients

Introduction to Authors

I am diabetologist who has spent his life practicing with disadvantaged populations. My expertise is treatment of metabolic disease. This methods section from one of our publications summarizes our work in intensive insulin therapy over four years in West Tennessee.ⁱ

ⁱⁱ The clinical setting was a safety-net rural community health center for the uninsured and underserved population in Hardin County, Tennessee. The patients were sick adults with significant, often disabling disease, typically on treatments that were ineffective or produced significant, often disabling disease, typically on treatments that were ineffective or produced significant clinical toxicities. This study occurred during a period of retrenchment in the state health insurance program. In this retrospective observational study, information on body weight and A1C measurements was collected over a period of four years and analyzed using proprietary and customized therapy and who sustained the treatment for up to 4 years were included in the study. Insulin glargine was used as the primary basal insulin, and insulin aspart was used as the primary bolus insulin. The correlations between net weight and change and net A1C required to achieve normoglycemia and near-normoglycemia were analyzed. Glycemic variability and psychosocial variables were outside the scope of the study.ⁱⁱⁱ

I understand all the complexities of keeping a cohort of chronically ill patients with disabling metabolic disease from a disadvantaged background and adverse circumstances in successful long term chronic care. The chronic care of metabolic disease works.

I am currently the Associate Statewide Medical Director for Centurion of Tennessee, vendor partner of Tennessee Department of Correction. In my current responsibility, I collaborate in the supervision and medical management for 18,000 inmates.

I specialize in managing complicated patients and complicated organizational dilemmas which require hands on guidance. During the past three years, I have studied criminal epidemiology. I am actively involved in utilization management. With reflection upon my day's work, hypothesis emerge from recurrent deep patterns which seem to lie behind the details of patient care and utilization management.

The reasonableness of my assumptions in the scenario analysis comes from my daily work at Centurion on Tennessee.

I am also medical director of the BHG Opioid Treatment Program in Jackson Tennessee.

Dr. Duane is a molecular physicist who has collaborated in numerous medical studies, including addiction medicine and psychiatry. Dr. Duane has worked extensively in mathematical modeling and is primarily responsible for the tables and charts presented in this document. Dr. Duane is an Associate of Yale University.

The opinions voiced in this document are ours alone

Introduction to metabolic diseases.

Diabetes Mellitus is a common, chronic, relapsing metabolic illness which is the leading cause of blindness, amputations, and renal failure in the United States.

Opioid Addiction is a chronic relapsing metabolic disease whose complications include premature death, incarceration, and "losing everything."

Like Diabetes, opioid addiction has its major clinical subtypes. Type 1 and type 2 are the classical clinical subtypes of diabetes which are the beginning points of clinical decision making. Similarly, opioid addiction produced by prescription pain killers is different from opioid addiction from heroin.

Heroin is aggressive, often used earlier in life, often with a rapid progressive to expensive, in hospital complications, with a residual of disability

Introduction to our patients and their world.

Since 2011, I have had patients in rural West Tennessee on buprenorphine. My current patients in West Tennessee on buprenorphine maintenance treatment have maintained remission from disease for up to five years, with many in remission for three or more years, and most in remission for over one year. The reasonableness of my assumptions in the scenario analysis is results from 5 years of in depth clinical experience with buprenorphine maintenance treatment with this patient cohort

Opioid addiction is common in Tennessee. Generations of the same family are often addicted to opioids. The patients will tell you that they lost everything prior to buprenorphine maintenance treatment. Their duration of illness is one to two decades. Many of them have had rehabilitation, from which they relapsed. Many of them have been on methadone maintenance. All of them have experienced a chronic relapsing illness. They have all failed in maintaining abstinence in abstinence based treatment alone.

My patients cross the socioeconomic spectrum. Most are hardworking blue collar. The majority of my patients have slightly more education and slightly more income than their peers in rural West Tennessee.

Reviewing the public records available from the Tennessee Bureau of Investigation, 67% of my patients have been arrested. Some have been arrested multiple times. 10% of my patients have been incarcerated in Tennessee prisons, some multiple times. Since beginning buprenorphine maintenance treatment, only one of my patients has been incarcerated.

All of my patients in West Tennessee will tell you that buprenorphine maintenance treatment has given them their life back. All of them feel privileged to have this treatment.

Fast forward to 2014, when I am working in Jackson, TN and Nashville TN. Heroin is now with us, with all of its malignant implications, both in term of illness and crime.

The nature of the epidemic is worsening. Furthermore, we now see the young, "emerging adults" on heroin. Their parents are upset beyond words. Instead of pursuing college or vocational success, they are pursuing heroin. The epidemic has changed and become more malignant.

Statement of Relevant Facts and Opinions

Understanding the Effectiveness of Buprenorphine Maintenance Treatment

In his classic paper, Vincent Dole, an endocrinologist at the Rockefeller Institute, pointed out that opioid addiction is a metabolic disease.

His research partner and wife, Marie Nyswanger, was the most important addiction psychiatrist of her time. In her classic work, The Drug Addict as Patient, Dr. Nyswanger present her extraordinary clinical insights which apply today.

Dr. Nyswanger worked at the United States Public Health Service Correctional Complex in Lexington, Kentucky. This federal prison hospital was well funded, and a major center for research and clinical care for inmates with opioid addictions. Dr. Nyswanger clearly and courageously states in her book that there was an over 90% failure rate from the abstinence based treatment used in Lexington. This honest assessment led to her partnership with Dr. Vincent Dole.

Dole and Nyswanger together innovated Methadone Maintenance Treatment. Their research proved the extraordinary clinical effectiveness of medical treatment of opioid addiction with methadone maintenance treatment long term. Unfortunately, their insights have been often lost.

Dr. Marie Nyswanger in her book states that abstinence based treatment consistently fails. A review of the medical literature at the Vanderbilt University Eskin Biomedical Library did not reveal a single long term study showing the abstinence based treatment being effective long term.

Contrary to popular opinion, Methadone maintenance treatment is not a religion, and patients with opioid addiction are not mortal sinners.

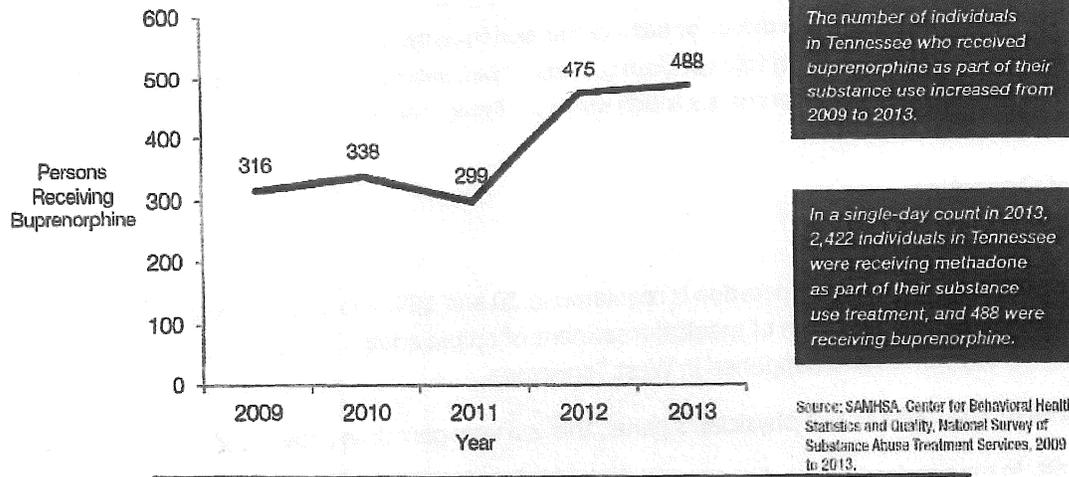
Summary: Buprenorphine Maintenance Treatment is an extraordinarily effective drug in producing remission in metabolic disease of opioid dependence. The effectiveness of long term buprenorphine treatment is vastly underestimated in today's current dialogue.

Factors Underlying Supply and Demand for Buprenorphine in Tennessee's Marketplace

Supply of buprenorphine maintenance treatment is driven by the following factors

1. The number of prescriptions allowed to each waived physician by federal regulation.
2. The number of physicians who choose to obtain a buprenorphine waiver.
3. Of those physicians who choose to obtain the waiver, the number of waived physicians who choose to prescribe buprenorphine will be significantly less than those with a waiver
4. Of those physicians with waivers who choose to prescribe buprenorphine, the majority of generalists choose to provide buprenorphine on a very short term basis for the purpose of detoxification.^{iv}

Individuals Enrolled in Substance Use Treatment in Tennessee Receiving Buprenorphine: Single-Day Counts (2009–2013)^{7,8}



This graph from SAMSHA suggests that 488 patients daily in Tennessee were receiving long term buprenorphine maintenance treatment in the period of 2009-2013. This graph from SAMSHA is obviously very old. However, its implications are collaborated by my patients who tell me their generalist physicians stopped their buprenorphine treatment in a few months

Buprenorphine maintenance treatment does not appear to be widely available in Tennessee.

This data also suggest that generalist physicians believe though the long term use of buprenorphine is a specialist responsibility. In Tennessee, the generalist physician, in general, limits his use of buprenorphine treatment to short term detoxification.

Short term detoxification is not effective treatment for a lifelong, metabolic illness whose relapses include death, incarceration, and losing it all.

Recommendations:

The most promising approach to rapidly increasing the number of patients in long term successful buprenorphine treatment is to allow ABAM certified physicians to prescribe up to 500 patients.

Opioid Addiction as a Driver of Crime, Incarceration, and Federally Mandated Health Care Costs in Tennessee

The Tennessee Department Bureau of Investigation states that 80% of the crime in Tennessee has a drug related nexus.^v The Tennessee Department of Corrections states that 6059 inmates are currently incarcerated for drug offenses for an average sentence of 10 years.^{vi}

The average annual cost of incarceration in Tennessee is \$23,144.65 in 2011^{vii}. The average cost of a day of jail is \$30 in 2011 The average cost of a month of jail is \$1000 in 2011

Once incarcerated, the inmate has eight amendment rights to comprehensive medical care. The population of inmates with opioid addiction are a disadvantaged group of patients, with many of them

have multiple comorbidities. With IV drug use in their problem list, many are impaired hosts who carry expensive, chronic illnesses with very expensive complications.

Summary: Opioid Addiction is a driver of both crime and incarceration in Tennessee. Uncontrolled opioid addiction is a driver of rapidly escalating costs of jail, incarceration, and correctional healthcare. IV Drug Use with Heroin is a much more malignant disease than prescription pain killer dependence.

Scale of Operation

In buprenorphine, the scale of operation is regulated at 30 and 100. The initial hope is that, at these numbers, a widespread adoption of medical treatment of opioid addiction would occur in primary care. This does not appear to have happened in West Tennessee.

At the total of 100 patients in a physician's panel, this is a very part time activity for a capable physician.

In contrast, in my previous internal medicine practice in rural Tennessee, I had four thousand patients in my electronic medical record. I routinely saw 800 or more patients per month in the office.

In contrast, in correctional healthcare, one physician to 1200 to 2400 inmates is common

Summary: Scale of Operation is highly elastic in medical care. Taking care of patients with opioid addiction as a specialist is no more difficult than taking care of patients with a metabolic disease in any other specialty.

Impact of Scale upon Innovation

The impact of treatment effectiveness of long term buprenorphine maintenance treatment is limited in magnitude by the limit of 100. The best physicians are unable to take of a large number of patients.

The impact that cumulative costs of non- treatment of opioid addiction will have is maximized by the treatment limit upon specialists.

Innovation by specialist physicians is facilitated by scale.

Larger physician groups devoted to addiction will be prominent and easily identified. Aberrant behavior or diversion can be recognized and managed by the DEA or the Tennessee Board of Medical Examiners.

Summary: Larger Scale of operation will permit specialists to innovate care. Larger scale of operation will allow specialist physicians the ability to reduce the long run negative cumulative cost on non-treatment.

Avoiding another Chronic Pain Debacle through Enlighten State Regulation, Faith in Board of Medical Examiners, and DEA

The catastrophic consequences of the era of Chronic pain do not have be elaborated for this audience.

The fear I have heard articulated from prominent addiction psychiatrists that right to Buprenorphine as a treatment may be lost by the irresponsible use of buprenorphine is an absolutely valid concern which must be listened to, respected, and heeded. The courage of this generation of addiction psychiatrists and their extraordinary leadership must be universally admired.

We all agree that Buprenorphine cannot become the next hydrocodone.

However, as the following scenarios present, continuing to limit treatment carries its own very significant risks.

Building larger scale addiction medicine groups is not the same as "pill mills for opioids." Bigger is not by definition bad.

The Tennessee Board of Medical Examiners can and will discipline the illicit or inappropriate prescription of buprenorphine for addiction. The DEA in Tennessee has the capacity to discipline practitioners who, in their judgment, require discipline.

The Tennessee Department of Mental Health and Substance Abuse has recently been granted the responsibility for licensure of buprenorphine groups and facilities.

Allowing the market to innovate will produce very visible organizations which will be under the watchful eye of The Tennessee Board of Medical Examiners, DEA in Tennessee, the Tennessee Department of Mental Health and Substance Abuse, the Tennessee Bureau of Investigation, and local law enforcement.

Please trust the State of Tennessee. Please trust us to innovate in treatment of opioid addiction with long term buprenorphine maintenance treatment while we simultaneously protect public safety.

The Importance of the American Board of Addition Medicine

We can certainly understand your choice of limiting expansion of patients to diplomates of the American Board of Preventive Medicine. That is the conservative choice. At first initial glance, that is the optimal choice. After all, American Board of Preventive Medicine is a traditional board. The decisions of the American Board of Preventive Medicine will be conservative. The American Board of Preventive Medicine will move slowly and gradually. The American Board of Preventive Medicine will not ask any questions about metabolic disease, criminal epidemiology, and health care economics.

Addiction medicine is an emerging discipline. There are very few volunteers.

By definition, everyone certified by American Board of Addiction Medicine (ABAM) began their career in another discipline. Those physicians who completed the requirements of the American Board of Addiction Medicine were the volunteers who choose to meet objectively measured standards in Addiction Medicine. The standardized examination given by the American Board of Addiction Medicine was comparable to the standardized examination given by the American Board of Internal Medicine. These physicians choose to meet standards.

The physicians certified by the American Board of Addiction Medicine often are mid- career physicians or physicians at the peak of their careers. Each of these physicians brings a wide range of professional experiences not taught in residencies or fellowships. This is a very capable group of physicians

The physicians certified by The American Board of Addiction Medicine are the vast majority of today's workforce. Like all immigrants, these physicians carry a capacity and willingness to serve in the current opioid epidemic.

Summary: ABAM certified physicians are the overwhelming largest pool of committed trained physicians in addiction medicine. Eliminating ABAM physicians from the higher patient limit will result in virtually no increase in patients receiving long term buprenorphine treatment in Tennessee in the next decade. Rome will burn while the Academy is slowly constructed in Athens. Eliminating ABAM is absolutely the wrong policy choice

I recommend in the strongest terms possible that the opportunity to qualify for a higher patient limit be broadened to include those addiction specialists with ABAM certification by striking the term "subspecialty" from §8.610(b)(1).

The Quantitative Analysis

Acknowledgement of Josann Duane, Ph.D. and Acknowledgment of Limits of Analysis

Josann Duane, Ph.D., retired from Faculty of Engineering at The Ohio State University, designed the quantitative modeling. Dr. Duane has her Ph.D. in physics.

Our scenario analysis is financial modeling of the future. Financial forecasting is most accurate if it is based upon assumptions which are currently valid, and upon financial relationships which currently exist, but are unrecognized. We believe that our assumptions are currently valid. We believe that the projections are valid.

We have not developed a fundamental econometric that we are using for this initial study. We have not done extensive data analysis. We acknowledge the clear limits of our work. We will use feedback from peer review of this model to extend the fundamental model

It is axiomatic in business school teaching that long run decisions that make long run, relatively irreversible commitments are usually made in the fog of high strategic uncertainty.

Scenario Number 1: Financial Contribution of 100 patients on Successful Buprenorphine Maintenance Treatment in West Tennessee

Assumptions of the Scenario

This scenario is a picture of my practice in rural West Tennessee. I have taken income figures provided by my patients. An annual income of \$25,000 is a conservative, reasonable number. Some make less, many make more. Virtually all of them will tell you that income and net worth improved dramatically over a period of years on buprenorphine maintenance treatment

11

Analysis:

Year	Annual Income
1	\$25,000
2	\$25,000
3	\$25,000
4	\$25,000
5	\$25,000
6	\$25,000
7	\$25,000
8	\$25,000
9	\$25,000
10	\$25,000

The net cash flow is \$25,000,000. The Net Present Value (NPV), with a discount rate of 5%, is \$19,304,000

Implications: Maintaining 100 patients in chronic care with buprenorphine maintenance treatment has a positive impact. The patients will tell you the same. Families are restored, homes are purchased, promotions are obtained. Buprenorphine maintenance treatment is the most effective metabolic treatment that I have ever prescribed.

Scenario Number 2: Financial Contribution of 1000 patients in Tennessee on long term buprenorphine treatment over 10 years if Federal Permission is Granted to Treat

Assumptions: This is a future scenario. If one thousand patients in Tennessee had long term buprenorphine treatment from my group, this the NPV of their income

Analysis:

Year	Annual Income	Number of patients
1	\$25,000	1000
2	\$25,000	1000
3	\$25,000	1000
4	\$25,000	1000
5	\$25,000	1000
6	\$25,000	1000
7	\$25,000	1000
8	\$25,000	1000
9	\$25,000	1000
10	\$25,000	1000

The Net Cash Flows are \$250,000,000. With a discount rate of 5%, the Net Present Value is \$193,043,372

Implications:

This scenario is an estimate of what our patients would contribute if my group was permitted 1000 patients per year in chronic care with buprenorphine maintenance treatment.

Scenario Number 3: Cost for 10 years for Non Treatment of 100 patients with IV Heroin Use in Tennessee associated with Current Federal Restrictions on Treatment

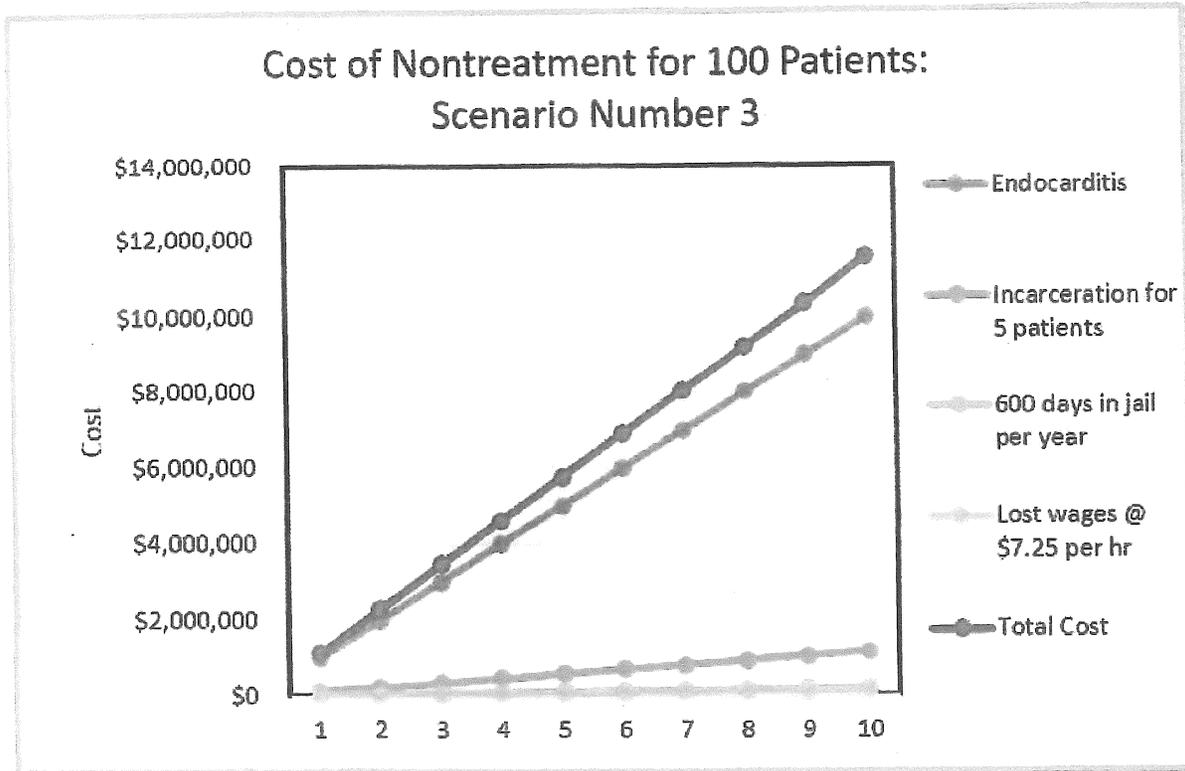
Assumptions: The assumptions underlying this analysis are very conservative. The reasonableness of these assumptions comes from my experience. For 100 patients of IV heroin users, which is becoming the norm, I have postulated the following

1. One hospital admission annually for endocarditis complicated by a mitral valve replacement at cost of \$1,000,0000
2. Five patients incarcerated for 10 years. In my patient sample in West Tennessee, 10% of my patients had been incarcerated, some more than once.
3. 60 patients in jail for a total of 10 days per year. In my patient sample in West Tennessee, 65% has been in jail, with a significant number having 10-20 admissions to jail.

While these assumptions are static, they are very conservative. In fact, these assumptions probably underestimate a serious and worsening situation in Tennessee.

Analysis:

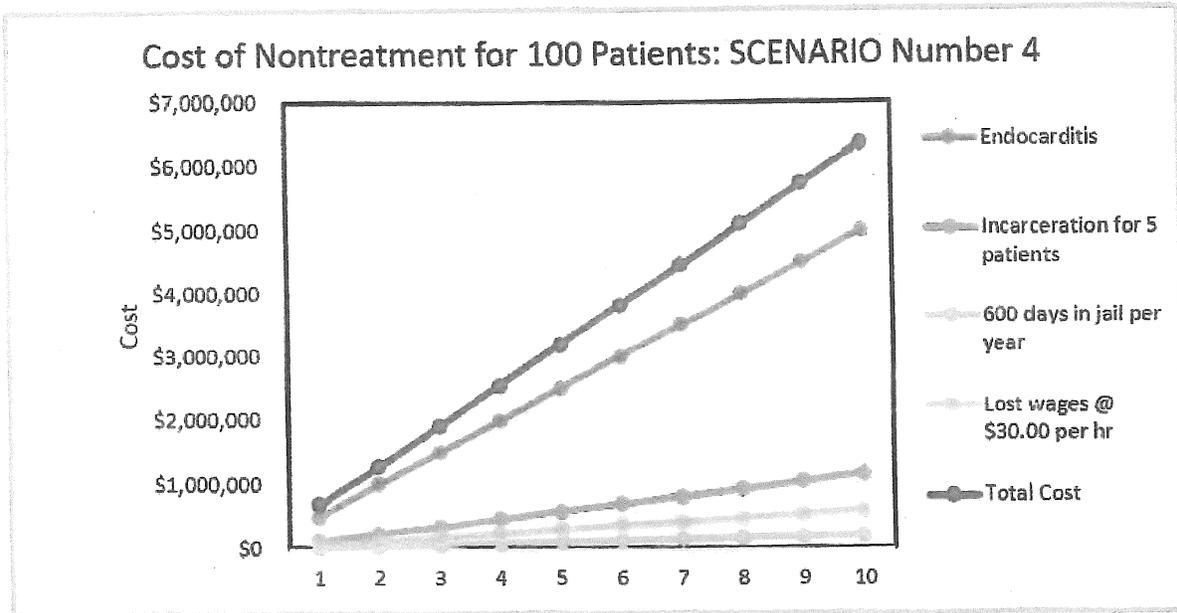
Cost for Nontreatment of 100 Patients: Scenario Number 3						
Year	Endocarditis	Incarceration for 5 patients	600 days in jail per year	Lost wages @ \$7.25 per hr	Total Cost	Number of Patients
1	\$1,000,000	\$115,720	\$21,000	\$14,500	\$1,151,220	100
2	\$2,000,000	\$231,440	\$42,000	\$29,000	\$2,302,440	100
3	\$3,000,000	\$347,160	\$63,000	\$43,500	\$3,453,660	100
4	\$4,000,000	\$462,880	\$84,000	\$58,000	\$4,604,880	100
5	\$5,000,000	\$578,600	\$105,000	\$72,500	\$5,756,100	100
6	\$6,000,000	\$694,320	\$126,000	\$87,000	\$6,907,320	100
7	\$7,000,000	\$810,040	\$147,000	\$101,500	\$8,058,540	100
8	\$8,000,000	\$925,760	\$168,000	\$116,000	\$9,209,760	100
9	\$9,000,000	\$1,041,480	\$189,000	\$130,500	\$10,360,980	100
10	\$10,000,000	\$1,157,200	\$210,000	\$145,000	\$11,512,200	100



Scenario Number 4: Cost for 10 Years for Non Treatment of a Mixture of Patients with Opioid Addiction under Current Federal Restrictions on Buprenorphine Treatment

Assumptions: In this analysis of non-treatment, the cost of medical care for 100 patients with opioid dependence has been reduced from \$1,000,000 per 100 patients to \$500,000 per 100 patients.

Year	Endocarditis	Incarceration for 5 patients	600 days in jail per year	Lost wages @ \$30.00 per hr	Total Cost	Number of Patients
1	\$500,000	\$115,720	\$21,000	\$60,000	\$696,720	100
2	\$1,000,000	\$231,440	\$42,000	\$120,000	\$1,273,440	100
3	\$1,500,000	\$347,160	\$63,000	\$180,000	\$1,910,160	100
4	\$2,000,000	\$462,880	\$84,000	\$240,000	\$2,546,880	100
5	\$2,500,000	\$578,600	\$105,000	\$300,000	\$3,183,600	100
6	\$3,000,000	\$694,320	\$126,000	\$360,000	\$3,820,320	100
7	\$3,500,000	\$810,040	\$147,000	\$420,000	\$4,457,040	100
8	\$4,000,000	\$925,760	\$168,000	\$480,000	\$5,093,760	100
9	\$4,500,000	\$1,041,480	\$189,000	\$540,000	\$5,730,480	100
10	\$5,000,000	\$1,157,200	\$210,000	\$600,000	\$6,367,200	100



Scenario Number 5: The Growth Scenario for Cumulative Cost of One Decade of Non Treatment of 10,000 IV Heroin Users under Current Federal Restrictions on Buprenorphine Treatment: The Non Treatment, The Delay of Treatment, Severe Restriction of Treatment Scenario

Assumptions:

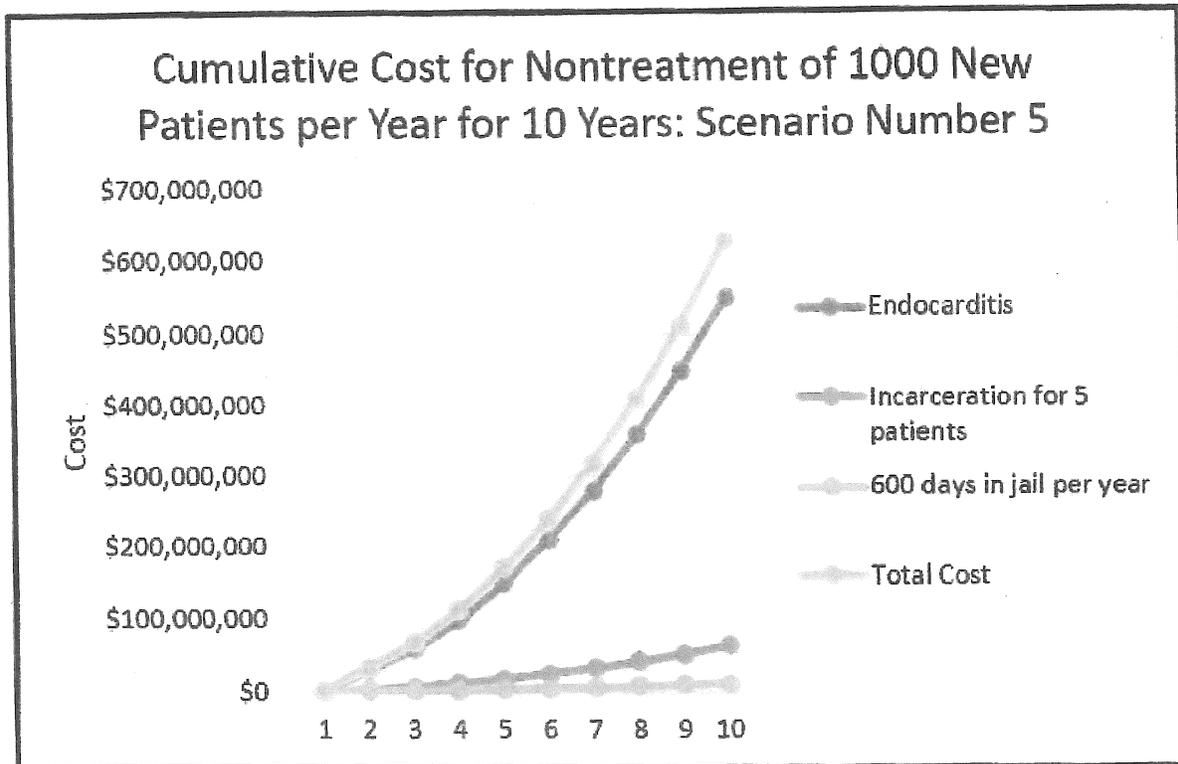
This is the most probable scenario. For 1000 patients using IV heroin, the following cost numbers have been used.

1. One hospital admission annually for endocarditis complicated by a mitral value replacement at cost of \$1,000,000 for each 100 patients. Instead of the particular of endocarditis complicated by mitral valve replacement, this is a generic \$1,000,000 of medical care for each 100 IV users of Heroin.
2. Five patients incarcerated for 10 years for each 100 patients in my patient sample in West Tennessee, 10% of my patients had been incarcerated, some more than once.
3. 60 patients in jail for a total of 10 days per year. In my patient sample in West Tennessee, 65% has been in jail, with a significant number having 10-20 admissions to jail.

The analysis begins with an initial sample of 1000 patient. Each year, an additional 1000 patients is added, for a final cohort of 10,000 patients at the end of year ten.

Analysis:

Cumulative Cost for Nontreatment of 1000 New Patients per Year for 10 Years: Scenario Number 5					
Year	Endocarditis	Incarceration for 5 patients	600 days in jail per year	Total Cost	Number of Patients
1	\$1,000,000	\$1,157,200	\$210,000	\$2,367,200	1,000
2	\$30,000,000	\$3,471,600	\$630,000	\$34,101,600	2,000
3	\$60,000,000	\$6,943,200	\$1,260,000	\$68,203,200	3,000
4	\$100,000,000	\$11,572,000	\$2,100,000	\$113,672,000	4,000
5	\$150,000,000	\$17,358,000	\$3,150,000	\$170,508,000	5,000
6	\$210,000,000	\$24,301,200	\$4,410,000	\$238,711,200	6,000
7	\$280,000,000	\$32,401,600	\$5,880,000	\$318,281,600	7,000
8	\$360,000,000	\$41,659,200	\$7,560,000	\$409,219,200	8,000
9	\$450,000,000	\$52,074,000	\$9,450,000	\$511,524,000	9,000
10	\$550,000,000	\$63,646,000	\$11,550,000	\$625,196,000	10,000



Implications:

1. This cohort represents the impact of limiting treatment to buprenorphine maintenance treatment in opioid epidemic increasingly driven by heroin.
2. This cohort grows to 10,000 patients over a decade, in increments of 1000 new patients per year. The total cumulative cost of non-treatment for this cohort is \$625,196,000.
3. The curve of the total costs of non-treatment is non-linear.
4. The second derivative of this curve is increasing, suggesting that the rate of growth of total costs is increasing.
5. Delay of Treatment or Non Treatment shifts patients from the lowest Cost Treatment Location (the office) to the highest cost treatment location (hospital).

Summary

1. Buprenorphine Maintenance Treatment is an extremely effective treatment in long term remission of opioid addiction when administered by skilled physicians.
2. A Specialist physician can produce long term remission in several hundred patients long term
3. Public safety will be enhanced, and diversion can be controlled with innovation by specialist physicians
4. Long term remission of opioid addiction with buprenorphine maintenance treatment will produce positive economic benefits to patients, their families, and their communities,

5. Failure to treat opioid addiction will be a catastrophic cost driver of both costs of public sector healthcare and costs of incarceration
6. Eliminating ABAM certification will eliminate the vast majority of today's committed, capable physicians who are dedicated to addiction medicine. If there is no one to come to work, the work will not get done. Eliminating ABAM will, in high probability, produce scenario number 5 in Tennessee
7. Current regulatory agencies in Tennessee can and will manage the downside risk of the federal liberalization of number of patients that can be treated with buprenorphine by specialist physicians.

Recommendations

1. Explicitly acknowledge diplomates of American Board of Addiction Medicine as specialists
2. Raise the limit to specialist physicians to 500 patients

ⁱ Insulin Volume 3 Number 2 April 2006 Duane and Conway

^{iv} SAMSHA Website

^v Tennessee Bureau of Investigation Website

^{vi} Tennessee Department of Correction Annual Statement 2015

^{vii} Knoxville News Sentinel. December 16, 2011

ADDICTION MEDICINE OF TENNESSEE

JACKSON • NASHVILLE • MEMPHIS
121 Carriage House Drive, Jackson, TN 38305
2125 Blakemore, B4, Nashville, TN 37212
Phone (615) 887-1036 • Fax (615) 540-0151

Conway Letter

WILLIAM CONWAY, MD, FACP, FASAM
DEA # - BC2922498
X# - XC2922498
NPI - 1306899943
License # - MD35708TN

CLEMENT BERNARD, M.D.
DEA # - BB2343111
X# - XB2343111
NPI - 1225025141
License # - MD29263TN

JORGE BENITEZ, M.D.
DEA # - FB2948670
X# - XB2948670
NPI - 1245405620
License # - MD47773TN

DONALD BRUCE, M.D.
DEA # - AB8857229
X# - XB8857229
NPI - 1154309474
License # - MD11077TN

CORTEZ TUCKER, M.D.
DEA # - BT2834693
X# - XT2834693
NPI - 1295836625
License # - MD41806TN

August 26, 2016

Kurt Hippel

Kurt.Hippel@tn.gov

Tennessee Department of Mental Health and Substance Abuse Services
Division of Administration and Legislation
5th Floor, Andrew Jackson Building
500 Deaderick Street
Nashville, TN 37243

Sent via Email August 26, 2016

Dear Mr. Hippel,

I am enclosing two documents for your review:

1. Analysis and Comments for the Rule Making Hearing for Regulation of OBOT
2. Five Different Scenarios for Tennessee's Future in Today's Opioid Epidemic: A net present Value and Cumulative Cost of Healthcare which will be driven by Federal Regulatory Decisions concerning Buprenorphine.

With the increasingly, widespread presence of heroin in Tennessee, the epidemic has become more malignant. Left in its current trajectory, the opioid epidemic in Tennessee promises to produce much future mortality and morbidity in conjunction with exploding public sector health care costs and exploding costs of medical care in incarceration.

William Conway, MD, MBA, FACP, FASAM 731-607-3257

Diplomate, American Board of Internal Medicine

Diplomate, American Board of Addiction Medicine

Maintenance of Certification in Addiction Medicine

Maintenance of Certification in American Board of Internal Medicine

Current Positions: Clinical Assistant Professor of Internal Medicine, Meharry Medical College

Executive Physician, Addiction Medicine of Tennessee

Medical Director, BHG Opioid Treatment Program, Jackson, TN.

Associate Statewide Medical Director, Centurion of Tennessee, Vendor Partner of Tennessee Department of Correction (TDOC)

Professional Societies: American College of Physicians, American Academy of Addiction Psychiatry, American Society of Addiction Medicine

Publications: *Insulin*. April 2008, p-95-108, *Insulin*. Oct 2008, p. 219-231



ADDICTION MEDICINE OF TENNESSEE

JACKSON • NASHVILLE • MEMPHIS
121 Carriage House Drive, Jackson, TN 38305
2125 Blakemore, B4, Nashville, TN 37212
Phone (615) 887-1036 • Fax (615) 540-0151

Conway Letter

I believe that the following are relevant considerations which impact the context of rulemaking for OBOT.

1. These are very small part time entities that you are regulating with very "small pockets", no access to capital, and no safety net.
2. Since the practice of addiction medicine is part time, the most capable physicians with ongoing maintenance of certification in internal medicine have a built in exit strategy, simply exiting the field.
3. The addiction medicine groups that you are regulating are the groups that State of Tennessee is depending upon for innovation and producing the solutions to the epidemic
4. Imposed regulatory costs do matter, for both survival and innovation
5. You can protect public safety without imposing an excessive regulatory burden
6. The dramatic upgrading of standards with the American Board of Preventive Medicine will confirm that some exceptionally able physicians are providing services while innovating the solutions to the ever changing face of the epidemic.

You have the opportunity to protect public safety while producing common sense regulation. Please do not make these regulations SOTA -Suboxone.

I am very impressed with the quality of you and your colleague's work product. I believe that your rules will have a very positive impact upon public safety. Thank you for your service.

Sincerely,

William Conway, MD

Treatment Needs Questionnaire

Patient Name/ID: _____

Date: _____

Staff Name/ID: _____

Ask patient each question, circle answer for each:

	Yes	No
Are you employed?	0	1
Do you have 2 or more <u>close</u> friends or family members who <u>do not</u> use alcohol or drugs?	0	1
Do you have a partner that uses drugs or alcohol?	1	0
Is your housing stable?	0	1
Do you have any legal issues (e.g., charges pending, probation/parole, etc)?	1	0
Have you ever been charged (not necessarily convicted) with drug dealing?	1	0
Are you currently on probation?	1	0
Do you have any psychiatric problems (e.g., major depression, bipolar, severe anxiety, PTSD, schizophrenia, personality subtype of antisocial, borderline, or sociopathy)?	1	0
Do you have a chronic pain issue that needs treatment?	2	0
Do you have access to reliable transportation?	0	1
Do you have a reliable phone number?	0	1
If you have ever been on medication-assisted treatment (e.g., methadone, buprenorphine) before, were you successful?	0	2
Do you have a problem with alcohol, have you ever been told that you have a problem with alcohol, or have you ever gotten a DWI/DUI?	2	0
Do you ever use cocaine, even occasionally?	1	0
Do you ever use benzodiazepines, even occasionally?	2	0
Are you motivated for treatment?	0	1
Are you currently going to any counseling, AA, or NA?	0	1
Do you have any significant medical problems (e.g., hepatitis, HIV, diabetes)?	1	0
Have you ever used a drug intravenously (IV)?	2	0
Are you a parent of a child under age 18? If so, does your child live with you?	0	1
Did you receive a high school diploma (e.g., did you complete >12 years of education)?	0	1

Calculate total: _____

Total possible points is 26.

Score: 0-10 Consider as candidate for lower-intensity/office-based treatment, with movement toward more intensive treatment if patient destabilizes.

Score: 11-26 Consider as candidate for higher-intensity/clinic-based treatment, followed by a potential reduction in intensity contingent upon documented treatment success.

©2015 SC Sigmon & JR Brooklyn, Licensed under CC BY-NC-ND 4.0

Medication-Assisted Treatment With Buprenorphine: Assessing the Evidence

Cindy Parks Thomas, Ph.D.
Catherine Anne Fullerton, M.D., M.P.H.
Meelee Kim, M.A.
Leslie Montejano, M.A., C.C.R.P.
D. Russell Lyman, Ph.D.

Richard H. Dougherty, Ph.D.
Allen S. Daniels, Ed.D.
Sushmita Shoma Ghose, Ph.D.
Miriam E. Delphin-Rittmon, Ph.D.

Objective: Buprenorphine maintenance treatment (BMT) and methadone maintenance treatment (MMT) are pharmacological treatment programs for individuals with opioid use disorders. MMT is discussed in a companion article. This article describes BMT and reviews available research on its efficacy. **Methods:** Authors reviewed meta-analyses, systematic reviews, and individual studies of BMT from 1995 through 2012. Databases surveyed were PubMed, PsycINFO, Applied Social Sciences Index and Abstracts, Sociological Abstracts, Social Services Abstracts, and Published International Literature on Traumatic Stress. They chose from three levels of evidence (high, moderate, and low) based on benchmarks for the number of studies and quality of their methodology. They also described the evidence of service effectiveness. **Results:** Sixteen adequately designed randomized controlled trials of BMT indicated a high level of evidence for its positive impact on treatment retention and illicit opioid use. Seven reviews or meta-analyses were also included. When the medication was dosed adequately, BMT and MMT showed similar reduction in illicit opioid use, but BMT was associated with less risk of adverse events. Results suggested better treatment retention with MMT. BMT was associated with improved maternal and fetal outcomes in pregnancy, compared with no medication-assisted treatment. Rates of neonatal abstinence syndrome were similar for mothers treated with BMT and MMT during pregnancy, but symptoms were less severe for infants whose mothers were treated with BMT. **Conclusions:** BMT is associated with improved outcomes compared with placebo for individuals and pregnant women with opioid use disorders. BMT should be considered for inclusion as a covered benefit. (*Psychiatric Services* 65:158–170, 2014; doi: 10.1176/appi.ps.201300256)

Dr. Thomas and Ms. Kim are with the Heller School for Social Policy and Management, Brandeis University, Waltham, Massachusetts (e-mail: cthomas@brandeis.edu). Dr. Fullerton and Ms. Montejano are with Truven Health Analytics, Cambridge, Massachusetts. Dr. Lyman and Dr. Dougherty are with DMA Health Strategies, Lexington, Massachusetts. Dr. Daniels and Dr. Ghose are with Westat, Rockville, Maryland. Dr. Delphin-Rittmon is with the Office of Policy, Planning, and Innovation, Substance Abuse and Mental Health Services Administration (SAMHSA), Rockville. This article is part of a series of literature reviews that will be published in Psychiatric Services over the next several months. The reviews were commissioned by SAMHSA through a contract with Truven Health Analytics and were conducted by experts in each topic area, who wrote the reviews along with authors from Truven Health Analytics, Westat, DMA Health Strategies, and SAMHSA. Each article in the series was peer reviewed by a special panel of Psychiatric Services reviewers.

More than two million individuals in the United States are addicted to opioids (1). Two common options for pharmacological maintenance treatment of opioid dependence are the opioid agonists methadone and buprenorphine. Over 300,000 individuals receive methadone through outpatient treatment programs (2). Over half of these programs and thousands of physicians now offer buprenorphine. Such pharmacological treatment is typically provided in combination with psychosocial or other support services.

This article reports the results of a literature review that was undertaken as part of the Assessing the Evidence Base Series (see box on next page). Methadone maintenance treatment (MMT) is reviewed in a companion article in this series (3). As discussed in that review, research has shown that MMT improves treatment outcomes for individuals with opioid dependence (4–7). However, MMT is associated with serious adverse events, such as respiratory depression and cardiac arrhythmias (8–10). Because of concern about these adverse events and medication diversion, MMT is restricted to dedicated opioid treatment programs that provide daily medication dosing and offer psychosocial treatment services. In this article, we review buprenorphine maintenance treatment (BMT) as an alternative to MMT for the long-term management of opioid use disorders.

For purposes of this initiative, the Substance Abuse and Mental Health Services Administration describes

medication-assisted treatment as a direct service that provides a person who has a substance use or mental disorder with pharmacotherapy in conjunction with behavioral therapies as treatment for associated symptoms or disabilities. BMT is a medication-assisted treatment that uses buprenorphine or buprenorphine-naloxone to treat individuals with an opioid use disorder. A definition of medication-assisted treatment with buprenorphine for opioid use disorders is presented in Table 1.

The objectives of this review were to describe BMT and its primary and secondary treatment goals, rate the level of evidence (methodological quality) of existing studies for this treatment, describe the degree of effectiveness of this service on the basis of the research literature, and compare the relative advantages and disadvantages of BMT and MMT.

Description of BMT

Buprenorphine has been available as an injectable medication at low doses to treat pain since the 1980s. In 2000, Congress passed the Drug Abuse Treatment Act (DATA), which allowed physicians to prescribe approved medications for long-term opioid treatment in settings other than opioid treatment clinics, such as in office-based facilities (11). In 2002, the U.S. Food and Drug Administration (FDA) approved high-dose sublingual formulations of buprenorphine and buprenorphine-naloxone for the treatment of opioid use disorders (11,12). Naloxone induces withdrawal symptoms if taken intravenously but not if taken orally. The manufacturer developed the combination buprenorphine-naloxone medication to decrease the potential for abuse and diversion. Buprenorphine and buprenorphine-naloxone became the first medications to be approved under DATA and the first medications available through DATA for office-based treatment of opioid dependence in the United States. Prescribing must be done within the guidelines of DATA, which requires that physicians receive specific training and certification before prescribing buprenorphine and that the number of patients they treat at one time be limited to 100 (originally 30 patients and amended in 2006) (13). In this review, we use bupre-

About the AEB Series

The Assessing the Evidence Base (AEB) Series presents literature reviews for 14 commonly used, recovery-focused mental health and substance use services. Authors evaluated research articles and reviews specific to each service that were published from 1995 through 2012 or 2013. Each AEB Series article presents ratings of the strength of the evidence for the service, descriptions of service effectiveness, and recommendations for future implementation and research. The target audience includes state mental health and substance use program directors and their senior staff, Medicaid staff, other purchasers of health care services (for example, managed care organizations and commercial insurance), leaders in community health organizations, providers, consumers and family members, and others interested in the empirical evidence base for these services. The research was sponsored by the Substance Abuse and Mental Health Services Administration to help inform decisions about which services should be covered in public and commercially funded plans. Details about the research methodology and bases for the conclusions are included in the introduction to the AEB Series (14).

norphine in reference to both buprenorphine and buprenorphine-naloxone sublingual tablets. Although buprenorphine can be used to manage withdrawal symptoms during acute detoxification from opioids, BMT refers to the maintenance use of buprenorphine to decrease illicit opioid use.

Because individuals remain dependent on buprenorphine, BMT is not considered an abstinence treatment. The goals of BMT are to reduce or eliminate illicit opioid use and, as a result, to decrease its associated negative outcomes (Table 1). This

assessment of the research will help inform behavioral health policy leaders about the merits of BMT as distinct from and in comparison to MMT. A summary of its value as a covered health benefit will also be of use to third-party payers, providers, and people making personal decisions about which medication to use.

Methods

Search strategy

We conducted a literature search of major databases: PubMed (U.S. National Library of Medicine and

Table 1

Description of medication-assisted treatment with buprenorphine

Feature	Description
Service definition	Medication-assisted treatment is a direct service that provides a person with a substance use or mental disorder with pharmacotherapy in conjunction with behavioral therapies as treatment for associated symptoms or disabilities. The nature of the services provided is determined by the person's current status or needs. Buprenorphine maintenance therapy is a medication-assisted treatment that uses buprenorphine or buprenorphine-naloxone to help individuals with an opioid use disorder abstain from or decrease the use of illegal opioids (for example, intravenous heroin) or the use of opioids in a nonprescribed manner (for example, abuse of prescription pain medications).
Service goals	Retention in treatment; decrease in illegal opioid use; decrease in mortality; decrease in nonopioid drug use; decrease in criminal activity; decrease in risk behaviors related to HIV and hepatitis C
Populations	Adults with opioid use disorders; pregnant women with opioid use disorders
Settings of service delivery	Office-based facilities; opioid treatment centers

National Institutes of Health), PsycINFO (American Psychological Association), Applied Social Sciences Index and Abstracts, Sociological Abstracts, Social Services Abstracts, and Published International Literature on Traumatic Stress.

We identified meta-analyses, research reviews, clinical guidelines, and individual studies about BMT that were published from 1995 through 2012. We found additional literature by examining the bibliographies of major reviews and meta-analyses, major clinical texts, and professional clinical society reviews. We relied on systematic reviews and meta-analyses to summarize relevant findings from earlier years. These review articles were supplemented with individual randomized controlled trials (RCTs) and quasi-experimental observational studies to provide additional information from recent years.

The terms used to search the literature were buprenorphine, buprenorphine/naloxone, opioid maintenance therapy, opioid treatment, addiction pharmacotherapy, medication-assisted maintenance treatment, buprenorphine maintenance therapy, and pregnancy. This review did not compare BMT to naltrexone, another medication used in opioid maintenance treatment, because the literature review uncovered no studies directly comparing the two medications.

Inclusion and exclusion criteria

The abstracts of identified articles were examined to determine compliance with the review inclusion and exclusion criteria. The following types of articles were included: RCTs, quasi-experimental studies, systematic review articles, meta-analyses, and clinical guidelines; English-language studies conducted in the United States, including international studies that used U.S.-based sites and international reviews encompassing U.S.-based studies; and studies that focused on BMT for individuals with opioid use disorders or the use of BMT during pregnancy.

Excluded were case studies, cross-sectional studies, and those with single-subject designs. Also excluded were studies that focused on buprenorphine use for pain management or for detoxification from opioids. Finally, reviews and meta-analyses that examined only studies that did not meet the inclusion criteria were excluded.

Strength of the evidence

The methodology used to rate the strength of the evidence is described in detail in the introduction to this series (14). The research designs of the identified studies were examined. Three levels of evidence (high, moderate, and low) were used to indicate the overall research quality of the collection of studies. Ratings were based on predefined benchmarks that considered the number of studies and their methodological quality. If ratings were dissimilar (occurring for 13% of the studies rated), a consensus opinion was reached.

In general, high ratings indicate confidence in the reported outcomes and are based on three or more RCTs with adequate designs or two RCTs plus two quasi-experimental studies with adequate designs. Moderate ratings indicate that there is some adequate research to judge the service, although it is possible that future research could influence reported results. Moderate ratings are based on the following three options: two or more quasi-experimental studies with adequate design; one quasi-experimental study plus one RCT with adequate design; or at least two RCTs with some methodological weaknesses or at least three quasi-experimental studies with some methodological weaknesses. Low ratings indicate that research for this service is not adequate to draw evidence-based conclusions. Low ratings indicate that studies have nonexperimental designs, there are no RCTs, or there is no more than one adequately designed quasi-experimental study.

We accounted for other design factors that could increase or decrease the evidence rating, such as how the service, populations, and interventions were defined; use of statistical methods to account for baseline differences between experimental and comparison groups; identification of moderating or confounding variables with appropriate statistical controls; examination of attrition and follow-up; use of psychometrically sound measures; and indications of potential research bias.

Effectiveness of the service

We described the effectiveness of the service—that is, how well the outcomes of the studies met the service goals. We

compiled the findings for separate outcome measures and study populations, summarized the results, and noted differences across investigations. We considered the quality of the research design in our conclusions about the strength of the evidence and the effectiveness of the service.

Results and discussion

Level of evidence

The literature search revealed 16 RCTs (15–30), a randomized cross-over study (31), a study using a self-administered survey (32), and a retrospective descriptive study (33). Summaries of these studies are provided in Table 2. RCTs used either buprenorphine alone or buprenorphine-naloxone, as noted in the table. The search also found seven reviews or meta-analyses (10,34–39), and summaries of these are provided in Table 3.

Because of the large number of trials, the overall evidence for BMT was rated as high. Thus the level of research evidence is similar for BMT and MMT (3). In addition, multiple meta-analyses, reviews, and more than three independent RCTs have compared BMT with MMT on the primary outcomes stated above, and these results are also based on a high level of evidence in RCTs (19,20) or reviews (34,36). Secondary outcomes, such as use of other illicit drugs, criminal behaviors, and other measures of addiction severity or psychosocial functioning varied among studies; as a result, the evidence for these secondary outcomes is not as strong.

Effectiveness of BMT

Buprenorphine versus placebo. Studies since 1995 have found buprenorphine to be a safe and effective treatment for opioid dependence. Compared with placebo, buprenorphine significantly improved treatment retention at low (2–6 mg), medium (7–15 mg), and high (≥ 16 mg) doses (15–17,34). In one meta-analysis, buprenorphine showed an improvement in treatment retention over placebo at low doses (relative risk [RR]=1.50, $p < .05$), medium doses (RR=1.74, $p < .05$), and high doses (RR=1.74, $p < .05$) (34). Higher dose ranges (16–32 mg) have been associated with better retention in treatment, compared with the

Table 2Individual studies of buprenorphine maintenance treatment (BMT) included in the review^a

Study	Design and objectives	Population and conditions	Outcomes measured	Summary of findings
Johnson et al., 1995 (18)	RCT to assess early clinical effectiveness of buprenorphine versus placebo in an opioid-dependent population	Patients randomly assigned to placebo (N=60) or to 2 mg (N=60) or 8 mg (N=30) daily of sublingual buprenorphine. On days 6–13, patients could request a dose change, knowing that the new dose would be randomly chosen from the 2 other alternatives.	Primary: percentage of patients in each group requesting a dose change. Secondary: positive urine opioid screens and patient satisfaction with treatment	Significant main effect of buprenorphine versus placebo. Patients taking buprenorphine requested fewer dose changes (27% for 2 mg and 32% for 8 mg versus 65% for placebo, $p < .01$). They also had fewer positive urine drug screens ($p < .05$) and rated dose adequacy higher ($p < .01$). Effects were significant for buprenorphine versus placebo but not for various doses.
Ling et al., 1996 (19)	RCT to evaluate safety and efficacy of long-term, fixed-dose BMT versus low- and high-dose MMT	225 treatment-seeking patients with opioid dependence randomly assigned to receive 8 mg per day of buprenorphine, 30 mg per day of methadone (low dose), or 80 mg of MMT (high dose), all over a 1-year period	Primary: urine toxicology, retention, craving, and withdrawal symptoms; safety data	At 26 and 52 weeks, the high-dose MMT group had better retention (31% versus 20% at 52 weeks, $p = .009$) and less opioid use ($p = .002$) than the low-dose MMT or fixed-dose BMT groups. Results were comparable in the latter two groups. No serious adverse health effects were noted for 8 mg of buprenorphine.
Ling et al., 1998 (16)	RCT to evaluate safety and efficacy of an 8 mg per day sublingual dose of buprenorphine versus a 1 mg per day dose over a 16-week treatment period in a heroin-dependent population; secondary analysis of 2 other dose levels (4 mg and 16 mg)	736 total patients in 4 dose groups: 1 mg, N=185; 4 mg, N=182; 8 mg, N=188; and 16 mg, N=181. Total of 375 completed the full 16 treatment weeks.	Primary: retention in treatment, illicit opioid use as indicated by urine drug screens, opioid craving, and global ratings	For retention, 40% in 1-mg group completed treatment, 51% in 4-mg group, 52% in 8-mg group, and 61% in 16-mg group. The 1-mg group had poorer retention than the 8-mg ($p = .019$) or 16-mg ($p < .001$) groups. The 8-mg group had significantly fewer positive screens than the 1-mg group, less craving, and higher global ratings ($p < .05$).
O'Connor et al., 1998 (25)	RCT to evaluate the effect of thrice weekly BMT in a primary care setting versus a traditional treatment facility	46 patients assigned to primary care treatment (N=23) or traditional treatment setting (N=23) for 12 weeks	Primary: treatment retention and urine drug tests	A trend toward higher retention at 12 weeks was noted in the primary care setting (78% versus 52%, $p = .06$). Patients in that setting had significantly lower rates of illicit opioid use as measured by urine drug tests (63% versus 85%, $p < .01$) but no difference in rates of cocaine use.
Johnson et al., 2000 (20)	RCT to compare levomethadyl acetate (75–115 mg), buprenorphine (16–32 mg), and high-dose (60–100 mg) and low-dose (20 mg) methadone as treatments for opioid dependence	220 patients, with 55 in each group; 51% completed the 17-week trial.	Primary: treatment retention, opioid use (percentage of positive urine screens), degree of continuous abstinence from opioid use (at least 12 consecutive opioid-free urine screens), and patients' reports of use. Secondary: percentage of cocaine-positive urine screens, abstinence from cocaine use, breath alcohol readings, side effects, and sex-related differences	No difference was found between high-dose buprenorphine and high-dose methadone in days in treatment (mean of 96 and 105 days, respectively) or percentage of patients with 12 or more consecutive negative screens (26% versus 28%, respectively). High-dose buprenorphine was superior to low-dose methadone for both outcomes (mean days, 96 versus 70, $p < .001$; consecutive negative screens, 26% versus 8%, $p = .005$).

Continues on next page

Table 2

Continued from previous page

Study	Design and objectives	Population and conditions	Outcomes measured	Summary of findings
Fudala et al., 2003 (17)	RCT to compare 4 weeks of office-based treatment with daily sublingual tablets of buprenorphine (16 mg) in combination with naloxone (4 mg), buprenorphine alone (16 mg), or placebo for patients addicted to opioids	323 patients receiving at least one dose of study medication; 109 randomly assigned to the combination medication, 105 to buprenorphine alone, and 109 to placebo	Primary: percentage of urine screens negative for opiates and self-reported craving for opiates by patients	During each of the 4 weeks, mean craving scores in the combined and buprenorphine groups were significantly lower than in the placebo group ($p < .001$ for both). Both groups with buprenorphine-based treatments had reduced opioid use. Opioid-negative screens: combined group, 17.8%; buprenorphine group, 20.7%; and placebo group, 5.8% ($p < .001$ for all)
Kakko et al., 2003 (15)	RCT to compare daily buprenorphine (fixed dose) versus a 6-day tapered regimen of buprenorphine followed by placebo; 12-month program combined with psychotherapy	40 patients randomly assigned to fixed-dose buprenorphine (N=20) or the tapered regimen (N=20)	Primary: 1-year retention in treatment and negative urine drug screens	One-year retention was 75% in the buprenorphine group and 0% in the placebo group ($p = .001$). Roughly 75% of the patients retained in treatment had negative urine screens for illicit opiates, stimulants, cannabinoids, and benzodiazepines.
Jones et al., 2005 (28)	RCT to compare NAS among neonates of MMT- and BMT-maintained pregnant, opioid-dependent women; provide preliminary safety and efficacy data	30 patients randomly assigned to MMT (N=15) or to BMT (N=15); 11 and 9, respectively, completed the study.	Primary: number of neonates treated for NAS, amount of medication used to treat NAS, length of neonatal hospitalization, and peak NAS score. Secondary: treatment retention and illicit opiate use	No significant difference in illicit opioid use between groups. Total of 20.0% and 45.5% of BMT-exposed and MMT-exposed neonates, respectively, were treated for NAS ($p = .23$). Other primary outcomes were also not significantly different, except that the BMT-exposed neonates had a shorter average hospital stay ($p = .021$).
Fischer et al., 2006 (29)	RCT to evaluate the efficacy and safety of MMT versus BMT for pregnant, opioid-dependent women	18 pregnant women randomly assigned to receive MMT (N=9) or BMT (N=9) during weeks 24–29 of pregnancy. After dropout, data were available from 14 cases (6 for methadone and 8 for buprenorphine).	Primary for mothers: treatment retention, urine drug screens, and nicotine use. Primary for neonates: routine birth data and severity and duration of NAS	For mothers, no significant difference in retention was found between groups. MMT group had significantly less use of additional opioids ($p = .029$). For neonates, earlier onset of NAS was noted in the MMT group; 43% of neonates in both groups combined did not require NAS treatment. Duration of NAS treatment was short in both groups (mean 5 days).
Kakko et al., 2007 (24)	RCT to compare adaptive, BMT stepped care versus optimal MMT	96 patients randomly assigned to flexible-dose MMT group (N=48) or BMT stepped-care group (N=48). In stepped treatment, buprenorphine could be increased to 32 mg. If participants required additional medication, they were switched (stepped) to high-dose methadone.	Primary: 6-month treatment retention, negative urine opioid screens, and problem severity	No differences between groups were found for retention (76% for both at 6 months) or the proportion of negative screens (80% for both groups). For the BMT stepped-care group, 17 completers did not switch to methadone and finished with a mean buprenorphine dose of 29.6 mg, and 20 completers switched to methadone and completed with a mean methadone dose of 111 mg. Methadone group ended with a mean dose of 110 mg.
Comer et al., 2010 (31)	Randomized cross-over study to assess intravenous abuse potential of buprenorphine-naloxone compared with buprenorphine among injection drug users receiving BMT	12 intravenous drug users living in a hospital for 8–9 weeks and receiving buprenorphine-naloxone under 3 BMT dose conditions: 2 mg, 8 mg, and 24 mg	Primary: reinforcing effects of intravenous buprenorphine-naloxone and buprenorphine among BMT-maintained intravenous drug users who were	Buprenorphine-naloxone intravenous abuse potential was lower than buprenorphine alone or heroin, particularly on higher maintenance doses. Intravenous buprenorphine-naloxone was self-administered less frequently than buprenorphine or heroin ($p < .001$). Selective ratings for

Continues on next page

Table 2*Continued from previous page*

Study	Design and objectives	Population and conditions	Outcomes measured	Summary of findings
Jones et al., 2010 (27)	RCT to examine neuro-behavioral effects for neonates exposed to MMT or BMT	175 pregnant women with opioid dependency assigned to MMT group (N=89) or BMT group (N=86)	Primary: reduction in opioid use, treatment retention, percentage of neonates treated for NAS, NAS peak score, length of hospital stay, morphine required to treat NAS given a drug-versus-money choice exercise	“drug liking” and “desire to take the drug again” were lower for buprenorphine-naloxone than for buprenorphine alone or heroin (p=.001). Treatment was discontinued by 18% of women in the MMT group and 33% in the BMT group; 58 mothers exposed to buprenorphine and 73 exposed to methadone were followed to the end of pregnancy. Neonates of the former group required less morphine (mean dose, 1.1 versus 10.4 mg, p<.009), had a shorter hospital stay (10.0 versus 17.5 days, p<.009), and had a shorter duration of NAS treatment (4.1 versus 9.9 days, p<.003).
Ling et al., 2010 (21)	RCT to determine efficacy of buprenorphine implants (6 month) versus placebo	163 patients received buprenorphine implants (N=108) or placebo implants (N=55) after induction with sublingual buprenorphine tablets	Primary: treatment retention and reduction in illicit opioid use as measured by urine drug screens. Secondary: drug craving and withdrawal symptoms	Significantly more patients with buprenorphine implants completed the study (65.7% versus 30.9%, p<.001). The buprenorphine group had more negative screens (40.4% versus 28.3%, p=.04), reduced withdrawal symptoms on the Clinical Opiate Withdrawal Scale (p<.001), and the Subjective Opiate Withdrawal Scale (p=.004), lower patient ratings for craving on the Visual Analog Scale—opioid craving (p<.001), fewer symptoms on the Clinical Global Impressions—Severity Scale (34.9% versus 19.1% with no symptoms, p<.001), and greater change on the Clinical Global Impressions—Improvement Scale (56.0% versus 23.4% reporting very much improvement at week 24, p<.001).
Lucas et al., 2010 (26)	RCT to compare clinic-based BMT with case management and referral and an opioid treatment program within an HIV clinic	93 HIV-positive, opioid-dependent patients not receiving opioid agonist therapy and not dependent on alcohol or benzodiazepines randomly assigned to receive BMT in an HIV clinic (N=46) or referred to an opioid treatment program, where they received either buprenorphine or methadone (N=47)	Primary: initiation and long-term treatment with opioid agonist therapy, urine screen results, visit attendance with primary HIV providers, use of antiretroviral therapy, and HIV treatment outcomes	A larger proportion of HIV clinic patients were on agonist therapy at 12 months (74% versus 41%; p<.001). Illicit opioid use was less in the clinic-based group (44% versus 65%; p=.015). HIV clinic patients had significantly fewer cocaine-positive screens and attended more HIV primary care visits. No difference was found in use of antiretroviral therapy or in improvements in HIV-monitoring tests.
Bazazi et al., 2011 (32)	Self-administered survey study to examine use, procurement, and motivations for use of diverted buprenorphine-naloxone	100 opioid users; 51 injecting users and 49 noninjecting users	Primary: illicit possession of buprenorphine-naloxone, use of diverted buprenorphine-naloxone, reasons for use, and use to “get high”	More noninjecting users reported ever using buprenorphine-naloxone to “get high” (69% versus 32%, p<.01). Most participants reporting past use of buprenorphine-naloxone stated that use was to treat withdrawal symptoms (74%) or to stop using other opioids (66%) or because they could not afford drug treatment (64%).

Continues on next page

Table 2

Continued from previous page

Study	Design and objectives	Population and conditions	Outcomes measured	Summary of findings
Weiss et al., 2011 (22)	Multiphase RCT to evaluate efficacy of brief and extended buprenorphine-naloxone treatment with various counseling intensities	First phase (N=653): brief treatment with buprenorphine-naloxone with a 2-week stabilization, 2-week taper, and 8-week postmedication follow-up. Patients entered the second phase if they had opioid-positive urine samples during the first phase. Second phase (N=360): 12 weeks of buprenorphine-naloxone treatment, 4-week taper, and 8-week postmedication follow-up. In both phases, patients were randomly assigned to receive standard (15-minute medical visits) or enhanced medical management (standard medical management plus opioid dependence counseling during 45-minute visits).	Primary: minimal or no opioid use as measured by urine samples that confirmed self-reports	All urine samples were negative after the first phase for only 6.6% of patients. During extended treatment with buprenorphine-naloxone, 49.2% of patients had successful outcomes (opioid-negative urine samples); this rate fell to 8.6% at 8-week follow-up. Addition of counseling had no effect in either phase.
Coyle et al., 2012 (30)	RCT to determine impact on infant neurobehavior of in-utero exposure to buprenorphine or methadone	39 full-term infants exposed to methadone (N=21) or buprenorphine (N=18)	Primary: neonatal neurobehavioral effects, measured on the neonatal intensive care unit's Network Neurobehavioral Scale	Infants exposed to buprenorphine exhibited fewer signs of stress abstinence ($p < .001$) and were less excitable ($p < .001$), less overaroused ($p < .01$), less hypertonic ($p < .007$), and better self-regulated ($p < .04$).
Moore et al., 2012 (23)	RCT to investigate impact of directly observed therapy plus cognitive-behavioral therapy versus usual treatment among patients receiving BMT for 12 weeks in primary care	55 opioid-dependent patients assigned to physician management with weekly buprenorphine dispensing (N=28) or with directly observed, thrice-weekly buprenorphine and cognitive-behavioral therapy (N=27)	Primary: treatment retention and drug use as measured by self-reports or urine screens	No difference was found between groups in treatment retention or drug use.
Pritham et al., 2012 (33)	Retrospective descriptive study to examine opioid replacement treatment in pregnancy and effect on neonatal outcomes	152 opioid-dependent pregnant women receiving MMT (N=136) or BMT (N=16) during pregnancy and their neonates	Primary: length of hospital stay for NAS	Neonates with prenatal exposure to MMT spent more days in the hospital for NAS (21 versus 14 days) ($p = .05$).

^a Studies are listed in chronological order. Abbreviations: MMT, methadone maintenance treatment; NAS, neonatal abstinence syndrome; RCT, randomized controlled trial

lower dose (69% versus 51%, $p = .006$) (35). At medium- and high-dose ranges, buprenorphine significantly

reduced illicit opioid use compared with placebo or with buprenorphine at a very low dose, as measured by

urine drug tests (15–18,34). For example, one RCT reported that for the group receiving 16 mg of buprenorphine,

38% of urine samples were negative for opioids, compared with 18% of samples for the group receiving 1 mg ($p < .001$) (16); another study found 21% opioid-negative urine samples with buprenorphine alone versus 6% with placebo ($p < .001$) (17). Studies have shown inconsistent results regarding reductions in nonopioid illicit drug use (for example, cocaine). However, most studies of buprenorphine have shown no statistically significant impact on reducing nonopioid illicit drug use compared with placebo (15,17,18,34). Although the addition of naloxone to buprenorphine has been shown to decrease abuse potential (31), naloxone has not been found to alter buprenorphine's efficacy (40).

Although buprenorphine implants were not FDA-approved in the United States at the time of this review, Ling and colleagues (21) examined the effect of six-month buprenorphine implants compared with placebo in a phase III trial. The study compared patients receiving buprenorphine implants ($N=108$) and those receiving placebo implants ($N=55$) after induction with sublingual buprenorphine tablets. Both groups had the option of receiving supplemental buprenorphine tablets for withdrawal symptoms or craving. Participants could also receive a supplemental dose upon request, if it was deemed suitable by the treating clinician. Results showed that a significantly higher percentage of those receiving buprenorphine implants completed the six-month study (65.7% versus 30.9%, $p < .001$). In addition, patients in the buprenorphine implant group had a significantly higher percentage of their urine samples negative for illicit opioids (40.4% versus 28.3%, $p = .04$). In regard to secondary outcomes, the buprenorphine implant group had significantly reduced withdrawal symptoms on the Clinical Opiate Withdrawal Scale ($p < .001$), and the Subjective Opiate Withdrawal Scale ($p = .004$), lower patient ratings of craving on the Visual Analog Scale—opioid craving ($p < .001$), fewer symptoms on the Clinical Global Impressions—Severity Scale (34.9% versus 19.1% with no symptoms, $p < .001$), and greater change on the Clinical Global Impressions—Improvement Scale (56.0%

versus 23.4% reporting very much improvement at week 24, $p < .001$).

Illicit use of buprenorphine. Concerns regarding diversion or nonmedical use of buprenorphine have emerged, even with the buprenorphine-naloxone combination (31,32,41). Comer and colleagues (31) confirmed that buprenorphine-naloxone retains some potential for abuse intravenously, but the combination has less abuse potential as measured by self-administration than buprenorphine alone or heroin. Surveys of individuals with opioid use disorders suggest that up to half of clients who use opioid drugs and seek treatment have used illicit buprenorphine. The clients typically stated that they used opioids for management of withdrawal symptoms and in attempts to decrease other opioid use (32,41,42). Individuals addicted to prescription opioids were more likely than those addicted to intravenous heroin to use buprenorphine to “get high” (32).

Prescription opioid dependence. A recent study examined the use of buprenorphine to treat patients with prescription opioid dependence. Weiss and colleagues (22) conducted the Prescription Opioid Addiction Treatment Study multiphase clinical trial in community treatment settings, reporting outcomes compared with baseline. The first phase examined brief treatment with buprenorphine and provided a two-week buprenorphine stabilization, two-week taper, and eight-week postmedication follow-up. Patients entered the second phase if they had relapsed (opioid-positive urine sample) during the initial phase. The second phase consisted of a 12-week buprenorphine treatment, four-week taper, and eight-week postmedication follow-up. In both phases, patients were randomly assigned to receive standard medical management (15-minute medical visits) or enhanced management (standard medical management plus opioid dependence counseling in 45-minute visits). Results showed that all urine samples were negative for only 6.6% of patients after the first phase (note that all participants received buprenorphine). During extended treatment with buprenorphine, 49.2% of patients had successful outcomes (all urine samples were opioid negative), but this per-

centage fell to 8.6% at the eight-week follow-up after buprenorphine was discontinued. Opioid dependence counseling had no effect in either phase. The authors concluded that patients dependent on prescription opioids have good outcomes with improved abstinence while taking buprenorphine, but if they are tapered off of this drug, the likelihood of successful outcomes in terms of no opioid use is low.

Psychosocial interventions and support services

The addition of structured psychotherapy to standard treatment—which may include peer support services, 12-step programs, and other psychosocial treatment provided at the facility or office—has not been shown to improve outcomes for patients on opioid maintenance therapy. A meta-analysis examined the impact of adding a more structured psychotherapy to standard treatment that included three types of opioid agonist therapy: levomethadyl acetate (LAAM; now off the U.S. market) (one study), methadone (28 studies), or buprenorphine (six studies) (37). The authors found no improvements in treatment retention or abstinence from illicit opioids and no effect on other outcomes, compliance, or psychiatric symptoms. It is important to note that in this meta-analysis, standard treatment may have included peer support, psychosocial treatment and counseling sessions, and referrals for additional support, but the meta-analysis examined only the effects of structured treatment in addition to support services already provided. A more recent study investigated the impact of directly observed therapy plus cognitive-behavioral therapy compared with regular medical management of BMT (23). Results showed no improvement in retention or drug use. It has been noted that the literature on psychosocial treatments is heterogeneous, and there is a lack of sufficient, high-quality studies to assess which psychosocial interventions have the most success in various populations (43).

BMT versus MMT. Several studies and meta-analyses have examined the use of BMT compared with MMT. Dose levels have been shown to be

Table 3Review articles about buprenorphine maintenance treatment (BMT) included in the review^a

Study	Focus of review	Population and conditions	Outcomes measured	Summary of findings
Barnett et al., 2001 (36)	Compare the effectiveness of buprenorphine and of methadone	Patients receiving methadone at medium-high (50–80 mg) and low (20–35 mg) doses and buprenorphine at medium doses (6–12 mg) across 5 RCTs	Primary: retention in treatment and urine drug screens for opioids	Compared with patients on medium-high methadone doses, those on medium doses of buprenorphine had 1.26 times the relative risk (RR) of discontinuing treatment ($p=.019$), and the rate of positive drug screens was 8.3% higher ($p=.002$). Buprenorphine was more effective than low doses of methadone in treatment retention (RR of discontinuing treatment=.86; ns) and reduction of positive drug screens (8.4% fewer, $p<.05$).
Mattick et al., 2008 (34)	Compare the effects of BMT with placebo and MMT on treatment retention and suppression of illicit drug use	Evaluated 24 RCTs involving 4,497 patients	Primary: retention in treatment and illicit drug use suppression	Treatment retention was higher with BMT compared with placebo at low doses (RR=1.50, $p<.05$), medium doses (RR=1.74, $p<.05$), and high doses (RR=1.74, $p<.05$).
McCance-Katz et al., 2010 (38)	Examine literature on methadone and buprenorphine for drug interactions with concurrent medications	Populations varied; extensive literature review with 93 references	Primary: drug interactions with methadone or buprenorphine	Buprenorphine had fewer drug interactions than methadone, especially with HIV medications.
Amato et al., 2011 (37)	Evaluate the effectiveness of any psychosocial treatment plus any agonist maintenance treatment versus standard agonist treatment	4,319 patients in 35 studies	Primary: retention in treatment and opiate abstinence; secondary: treatment compliance, psychiatric symptoms, depression, and death	Adding any psychosocial support to standard maintenance treatments did not appear to give additional benefits.
Martin et al., 2011 (10)	Examine literature, regulatory actions, professional guidance, and opioid treatment program experiences regarding adverse cardiac events associated with methadone	Populations varied; extensive literature review with 108 references and input from panel and field experts	Primary: cardiac events associated with methadone; impact on cardiac QT interval	The pharmacology of buprenorphine affords it a better safety profile than methadone; buprenorphine (at standard doses) did not affect cardiac electrophysiology by lengthening the cardiac QT interval.
Fareed et al., 2012 (35)	Meta-analysis to provide information about proper dosing in BMT to improve treatment outcomes	Compared higher doses of buprenorphine (16–32 mg per day) to lower dose (<16 mg per day) across 21 RCTs involving 2,703 patients	Primary: treatment retention and reduction in opioid use	Higher doses of buprenorphine were associated with better treatment retention than the lower dose (69% versus 51%, $p=.006$).
Jones et al., 2012 (39)	Review literature on outcomes after maternal treatment with buprenorphine	Evaluated outcomes of 3 RCTs and 44 nonrandomized studies	Primary: fetal effects, neonatal effects, effects on breast milk, and longer-term developmental effects	Maternal treatment with buprenorphine had similar efficacy to methadone. Prenatal buprenorphine treatment resulted in less severe neonatal abstinence syndrome than methadone treatment. No adverse effects on infant development of in-utero buprenorphine exposure were found. Dose increases for methadone and buprenorphine may be needed during pregnancy.

^a Studies are listed in chronological order. Abbreviations: MMT, methadone maintenance treatment; RCT, randomized controlled trial

important for efficacy of both drugs. In this discussion, we define methadone dose ranges as high (≥ 60 mg), medium (40–59 mg), and low (<40 mg). We define buprenorphine dose ranges

as high (16–32 mg), medium (7–15 mg), and low (2–6 mg).

Barnett and colleagues (36) performed a meta-analysis of data from five RCTs conducted between 1992

and 1997. The authors compared the efficacy of methadone at medium-high doses (50–80 mg) and low doses (20–35 mg) and buprenorphine at medium doses (6–12 mg). Results

showed that patients on medium doses of buprenorphine had 1.26 times the relative risk of discontinuing treatment ($p=.019$), and the number of positive urine samples was 8.3% higher than the number for patients on medium-high doses of methadone ($p=.002$). However, compared with lower doses of methadone (20–30 mg per day), buprenorphine was more effective in treatment retention (RR for discontinuing treatment=.86, not significant) and in reduction of positive urine drug tests (8.4% fewer positive urine samples per patient, $p<.05$). Ling and colleagues (19) found similar results. High-dose methadone (80 mg) was superior to medium-dose buprenorphine (8 mg) and low-dose methadone (30 mg) for treatment retention and opioid use.

A more recent meta-analysis comparing BMT and MMT was based on 25 RCTs and 4,497 participants (34). The authors found results that were similar to the study by Barnett and colleagues (36). Specifically, this meta-analysis found mixed results for medium-dose buprenorphine versus medium- and low-dose methadone in retaining patients. Three studies suggested that MMT was superior, whereas seven found no difference between the groups, although results differed by dose. Medium-dose buprenorphine was less likely to suppress illicit opioid use than medium-dose methadone (standard mean difference [SMD]=.27, $p<.05$), but it was more likely to suppress illicit opioid use than low-dose methadone (SMD=-.23, $p<.05$). Treatment retention was worse for low-dose buprenorphine than for medium- and low-dose methadone (RR for both comparisons=.67, $p<.05$). Low-dose buprenorphine showed no difference in illicit opioid use compared with low-dose methadone, but low-dose buprenorphine was inferior to medium-dose methadone in terms of illicit opioid use (SMD=.88, $p<.05$). In the meta-analysis, flexible-dose buprenorphine and methadone had similar results for illicit opioid use, and methadone had a slight (but statistically significant) edge for retention in treatment—despite the fact that most studies found no difference. Of note, several of the studies used buprenorphine in low- or medium-dose ranges,

and the flexible-dose ranges were not higher than 16 mg. No statistically significant differences were found between methadone and buprenorphine at any dose comparison for use of other illicit drugs (primarily cocaine) or criminal activity.

Johnson and colleagues (20) conducted a 17-week RCT ($N=220$) to compare the effects of LAAM (75–115 mg), high-dose buprenorphine (16–32 mg), high-dose methadone (60–100 mg), and low-dose methadone (20 mg). Although LAAM is no longer marketed in the United States, the comparison of high-dose buprenorphine, high-dose methadone, and low-dose methadone is still important. The results supported the value of high-dose buprenorphine; no difference was found between high-dose buprenorphine and high-dose methadone in the mean number of days in treatment (96 and 105 days, respectively) or in the percentage of participants with 12 or more consecutive urine samples that were negative for illicit opioids (26% and 28%). High-dose buprenorphine was superior to low-dose methadone in terms of the mean number of days in treatment (96 versus 70, respectively, $p<.001$) and percentage of participants with consecutive negative urine samples (26% versus 8%, $p=.005$).

Kakko and colleagues (24) tested the efficacy of a stepped-care strategy that used buprenorphine in increasing doses. The researchers compared a flexible-dose MMT group ($n=48$) and a stepped-care BMT group ($N=48$). In the stepped-treatment group that used a flexible-dose algorithm, buprenorphine could be increased up to 32 mg. If participants required additional medication, they were switched (stepped) to high-dose methadone. The study found no differences between the stepped-care BMT and MMT groups in treatment retention (76% for both at six months) or in the proportion of urine samples that were free of illicit opioids (80% for both groups). In the buprenorphine stepped-care group, 17 participants who completed treatment did not switch to methadone and finished with a mean buprenorphine dose of 29.6 mg, and 20 participants who completed treatment switched to meth-

adone and finished with a mean methadone dose of 111.0 mg. Those in the methadone group ended with a mean dose of 110.0 mg.

The pharmacology of buprenorphine affords it a better safety profile than methadone, which is important considering that methadone is associated with one-third of opioid-related overdose deaths annually (44). Because it is a partial agonist at the mu opiate receptor, it has a ceiling effect that limits its potential to cause respiratory depression compared with methadone (45). However, this risk still exists, especially if buprenorphine is used in combination with other central nervous system depressants such as benzodiazepines or alcohol (8) or is used in higher doses. In addition, unlike methadone, buprenorphine at standard doses does not affect cardiac electrophysiology by lengthening the cardiac QT interval—a mechanism that can lead to serious cardiac arrhythmias (10). Buprenorphine also has fewer drug interactions than methadone, especially with HIV medications (38).

Taken together, the articles reviewed suggest that the efficacy of BMT is dose dependent, and dose is important to take into account when comparing medications. For comparisons at medium-dose ranges, evidence is mixed—some studies show similar effects of MMT and BMT and some studies suggest that MMT improves treatment retention or reduces illicit opioid use. Only one study reviewed compared high doses of buprenorphine and methadone, and it showed similar outcomes (20). Finally, the stepped-care approach—in which individuals begin with buprenorphine and switch to methadone if buprenorphine doses above 32 mg are required—suggests that MMT may be needed for patients who require high doses of opioid agonist treatment (24).

Treatment setting. We reviewed two studies examining the receipt of BMT in an office-based setting compared with treatment in a traditional drug treatment program. In an early RCT (1998), O'Connor and colleagues (25) compared patients randomly assigned to receive BMT in a primary care setting ($N=23$) or a traditional drug treatment program ($N=23$). During the 12-week study,

Evidence for the effectiveness of BMT: high

Evidence clearly shows that BMT has a positive impact compared with placebo on:

- Retention in treatment
- Illicit opioid use

Evidence is mixed for its impact on:

- Nonopioid illicit drug use

retention showed a trend toward being higher in the primary care setting, compared with the traditional setting (78% versus 52%, respectively, $p=.06$). Patients in the primary care setting had significantly lower rates of illicit opioid use on the basis of urine drug tests (63% versus 85%, $p<.01$), but they showed no difference in rates of cocaine use. Lucas and colleagues (26) compared outcomes of HIV-positive patients randomly assigned to receive BMT in an HIV clinic ($N=46$) or an opioid treatment program in which they received either buprenorphine or methadone ($N=47$). A significantly higher proportion of the patients in the HIV clinic were receiving agonist therapy at 12 months (74% versus 41%, $p<.001$). Illicit opioid use, as measured by urine drug tests, was less in the clinic-based group (44% versus 65% of patients; $p=.015$). In addition, the study showed that patients treated in the HIV clinic had significantly fewer cocaine-positive urine drug tests and attended more HIV primary care visits. The groups did not differ in use of antiretroviral therapy or in improvements in tests used to monitor HIV. The authors speculated that streamlined access to treatment in the clinic group was a major reason for the improved results.

None of the RCTs reviewed were implemented in incarcerated populations. A recent survey of criminal justice agencies indicated that medication-assisted treatment of incarcerated individuals is generally limited to pregnant women and detoxification (46).

Buprenorphine use in pregnancy. MMT has been used to treat opioid dependence during pregnancy to improve maternal and fetal outcomes (47,48). However, as discussed in the companion article (3), MMT puts newborn infants at risk for neonatal abstinence syndrome (NAS). NAS often

requires detoxification treatment in the hospital with a morphine taper (49–53). As a result, clinicians and researchers have studied BMT as an alternative to MMT during pregnancy. RCTs were conducted with buprenorphine alone, to avoid prenatal exposure to naloxone.

Three RCTs and observational studies (27–29,39) have compared use of buprenorphine with use of methadone by pregnant women. Authors concluded that buprenorphine has similar efficacy to methadone in reducing illicit opioid use among pregnant women, and buprenorphine may lead to less severe NAS. With both MMT and BMT, dose increases may be necessary during pregnancy (39). Although the two smaller RCTs did not find a difference in treatment retention between BMT and MMT (28,29), the largest RCT—the Maternal Opioid Treatment: Human Experimental Research study (27)—found that a higher percentage of patients in the BMT group discontinued treatment before delivery (33% versus 18%, $p=.02$). Mothers were more likely to discontinue treatment in both groups if they had higher cumulative lifetime months and recent days of heroin use (27). Two RCTs showed no difference in illicit opioid use between the two medications (27,28), whereas one RCT suggested that methadone may be superior in reducing illicit opioid use (29). Infants born to mothers maintained with buprenorphine versus methadone had similar rates of NAS, but the manifestation of NAS was less severe. Infants whose mothers took buprenorphine required significantly lower doses of morphine to treat NAS and needed fewer hospital days (27,30,33).

Conclusions

Overall, a high level of evidence was found for the effectiveness of BMT in

improving treatment retention and decreasing illicit opioid use (see box on this page). Research regarding the impact of BMT on nonopioid illicit drug use is less conclusive but suggests positive trends. The addition of any type of psychosocial regimen to BMT or MMT has not been shown to improve outcomes, but the heterogeneity of interventions across trials limits the ability to make strong conclusions. As with MMT, there is growing evidence that higher doses of buprenorphine (16–32 mg) are more efficacious than lower doses; however, because of the pharmacology of buprenorphine, doses above 32 mg do not provide additional efficacy. Research suggests that buprenorphine may be as effective for patients with prescription opioid dependence as it is for patients with heroin dependence. When the medications are dosed similarly, BMT appears to be as effective as MMT in reducing illicit opioid use. Results are mixed regarding treatment retention, but several studies suggest that MMT might confer some advantage. The advantage may be due, in part, to the supportive services or social reinforcement in outpatient MMT programs. However, buprenorphine has a better safety profile than methadone, and the ability to prescribe buprenorphine in office facilities as opposed to only in opioid treatment programs improves access to care and earlier initiation of treatment. A key advantage of buprenorphine is its availability. The number of clinicians approved to prescribe buprenorphine is growing, although many areas of the country do not have access to methadone programs (2).

Both BMT and MMT improve pregnancy-related outcomes by reducing illicit drug use during pregnancy. Infants of mothers treated with buprenorphine during pregnancy may be born with NAS, although NAS appears to be less severe in infants of mothers treated with buprenorphine than of those treated with methadone.

Potential areas for future research include increased focus on the impact of BMT on secondary outcomes, additional investigation of appropriate dosing to enhance treatment outcomes, confirmation of the results of the stepped-care protocol, improved

induction protocols to minimize initial problems with treatment retention (and thus potentially enhance adoption rates by providers), and examination of the differential effectiveness of BMT in specific subpopulations, such as patients dependent on prescription opioids versus heroin. Differential effects and access to BMT across racial and ethnic groups and geographic areas should also be studied.

Ongoing research needs do not diminish the strong evidence for this treatment approach. Given the poor success rates of abstinence-based treatments for opioid use disorders and the limited access to and more restrictive safety profile of MMT, BMT is an important treatment for opioid dependence. Policy makers have reason to promote access to BMT for patients in substance use treatment who may wish to choose BMT as a potentially safer alternative to MMT. Administrators of substance use treatment programs, community health centers, and managed care organizations and other purchasers of health care services, such as Medicare, Medicaid, and commercial insurance carriers, should give careful consideration to BMT as a covered benefit.

Acknowledgments and disclosures

Development of the Assessing the Evidence Base Series was supported by contracts HHSS2832007000291/HHSS28342002T, HHSS2832007000061/HHSS28342003T, and HHSS2832007000171/HHSS28300001T from 2010 through 2013 from the Substance Abuse and Mental Health Services Administration (SAMHSA). The authors acknowledge the contributions of Robert Lubran, M.S., M.P.A., Kevin Malone, B.A., and Suzanne Fields, M.S.W., from SAMHSA; John O'Brien, M.A., from the Centers for Medicare & Medicaid Services; John Easterday, Ph.D., Linda Lee, Ph.D., Rosanna Coffey, Ph.D., and Tami Mark, Ph.D., from Truven Health Analytics; and Sandrine Pirard, M.D., Ph.D., from National Institute on Drug Abuse. The views expressed in this article are those of the authors and do not necessarily represent the views of SAMHSA.

The authors report no competing interests.

References

1. Topics in Brief: Medication-Assisted Treatment for Opioid Addiction. Bethesda, Md, National Institute on Drug Abuse, April 2012. Available at www.drugabuse.gov/publications/topics-in-brief/medication-assisted-treatment-opioid-addiction. Accessed Sept 14, 2013
2. The N-SSATS Report: Trends in the Use of Methadone and Buprenorphine at

Substance Abuse Treatment Facilities: 2003 to 2011. Rockville, Md, Substance Abuse and Mental Health Services Administration, Center for Behavioral Health Statistics and Quality, 2013

3. Fullerton CA, Kim M, Thomas CP, et al: Medication-assisted treatment with methadone: assessing the evidence. *Psychiatric Services*. 2013; doi 10.1176/appi.ps.201300235
4. Connock M, Juarez-Garcia A, Jowett S, et al: Methadone and buprenorphine for the management of opioid dependence: a systematic review and economic evaluation. *Health Technology Assessment* 11(9): 1-171, 2007
5. Fletcher BW, Battjes RJ: Introduction to the special issue: treatment process in DATOS. *Drug and Alcohol Dependence* 57:81-87, 1999
6. Hall W, Ward J, Mattick R: The Effectiveness of Methadone Maintenance Treatment I: Heroin Use and Crime. Utrecht, Netherlands, Harwood Academic Publishers, 1998
7. Mattick RP, Breen C, Kimber J, et al: Methadone maintenance therapy versus no opioid replacement therapy for opioid dependence. *Cochrane Database of Systematic Reviews* 3:CD002209, 2009
8. Webster LR, Cochella S, Dasgupta N, et al: An analysis of the root causes for opioid-related overdose deaths in the United States. *Pain Medicine* 12(suppl 2): S26-S35, 2011
9. Modesto-Lowe V, Brooks D, Petry N: Methadone deaths: risk factors in pain and addicted populations. *Journal of General Internal Medicine* 25:305-309, 2010
10. Martin JA, Campbell A, Killip T, et al: QT interval screening in methadone maintenance treatment: report of a SAMHSA expert panel. *Journal of Addictive Diseases* 30:283-306, 2011
11. Fiellin DA, O'Connor PG: New federal initiatives to enhance the medical treatment of opioid dependence. *Annals of Internal Medicine* 137:688-692, 2002
12. Subutex and Suboxone Approved to Treat Opiate Dependence. T02-38. Silver Spring, Md, US Food and Drug Administration, 2002. Available at www.fda.gov/Drugs/DrugSafety/PostmarketDrugSafety/InformationforPatientsandProviders/ucm191521.htm
13. Frequently Asked Questions About Buprenorphine and the Drug Addiction Treatment Act of 2000. (DATA 2000). Rockville, Md, Substance Abuse and Mental Health Services Administration. Available at buprenorphine.samhsa.gov/faq.html#A11. Accessed Sept 19, 2013
14. Dougherty RH, Lyman DR, George P, et al: Assessing the evidence base for behavioral health services: introduction to the series. *Psychiatric Services*, 2013; doi 10.1176/appi.ps.201300214
15. Kakko J, Svanborg KD, Kreek MJ, et al: 1-year retention and social function after buprenorphine-assisted relapse prevention treatment for heroin dependence in Sweden:

a randomised, placebo-controlled trial. *Lancet* 361:662-668, 2003

16. Ling W, Charuvastra C, Collins JF, et al: Buprenorphine maintenance treatment of opiate dependence: a multicenter, randomized clinical trial. *Addiction* 93:475-486, 1998
17. Fudala PJ, Bridge TP, Herbert S, et al: Office-based treatment of opiate addiction with a sublingual-tablet formulation of buprenorphine and naloxone. *New England Journal of Medicine* 349:949-958, 2003
18. Johnson RE, Eissenberg T, Stitzer ML, et al: A placebo controlled clinical trial of buprenorphine as a treatment for opioid dependence. *Drug and Alcohol Dependence* 40:17-25, 1995
19. Ling W, Wesson DR, Charuvastra C, et al: A controlled trial comparing buprenorphine and methadone maintenance in opioid dependence. *Archives of General Psychiatry* 53:401-407, 1996
20. Johnson RE, Chutuape MA, Strain EC, et al: A comparison of levomethadyl acetate, buprenorphine, and methadone for opioid dependence. *New England Journal of Medicine* 343:1290-1297, 2000
21. Ling W, Casadonte P, Bigelow G, et al: Buprenorphine implants for treatment of opioid dependence: a randomized controlled trial. *JAMA* 304:1576-1583, 2010
22. Weiss RD, Potter JS, Fiellin DA, et al: Adjunctive counseling during brief and extended buprenorphine-naloxone treatment for prescription opioid dependence: a 2-phase randomized controlled trial. *Archives of General Psychiatry* 68:1238-1246, 2011
23. Moore BA, Barry DT, Sullivan LE, et al: Counseling and directly observed medication for primary care buprenorphine maintenance: a pilot study. *Journal of Addiction Medicine* 6:205-211, 2012
24. Kakko J, Grönbladh L, Svanborg KD, et al: A stepped care strategy using buprenorphine and methadone versus conventional methadone maintenance in heroin dependence: a randomized controlled trial. *American Journal of Psychiatry* 164:797-803, 2007
25. O'Connor PG, Oliveto AH, Shi JM, et al: A randomized trial of buprenorphine maintenance for heroin dependence in a primary care clinic for substance users versus a methadone clinic. *American Journal of Medicine* 105:100-105, 1998
26. Lucas GM, Chaudhry A, Hsu J, et al: Clinic-based treatment of opioid-dependent HIV-infected patients versus referral to an opioid treatment program: a randomized trial. *Annals of Internal Medicine* 152:704-711, 2010
27. Jones HE, Kaltenbach K, Heil SH, et al: Neonatal abstinence syndrome after methadone or buprenorphine exposure. *New England Journal of Medicine* 363:2320-2331, 2010
28. Jones HE, Johnson RE, Jasinski DR, et al: Buprenorphine versus methadone in the treatment of pregnant opioid-dependent patients: effects on the neonatal abstinence

- syndrome. *Drug and Alcohol Dependence* 79:1–10, 2005
29. Fischer G, Ortner R, Rohrmeister K, et al: Methadone versus buprenorphine in pregnant addicts: a double-blind, double-dummy comparison study. *Addiction* 101:275–281, 2006
 30. Coyle MG, Salisbury AL, Lester BM, et al: Neonatal neurobehavior effects following buprenorphine versus methadone exposure. *Addiction* 107(suppl 1):63–73, 2012
 31. Comer SD, Sullivan MA, Vosburg SK, et al: Abuse liability of intravenous buprenorphine/naloxone and buprenorphine alone in buprenorphine-maintained intravenous heroin abusers. *Addiction* 105:709–718, 2010
 32. Bazazi AR, Yokell M, Fu JJ, et al: Illicit use of buprenorphine/naloxone among injecting and noninjecting opioid users. *Journal of Addiction Medicine* 5:175–180, 2011
 33. Pritham UA, Paul JA, Hayes MJ: Opioid dependency in pregnancy and length of stay for neonatal abstinence syndrome. *Journal of Obstetric, Gynecologic, and Neonatal Nursing* 41:180–190, 2012
 34. Mattick RP, Kimber J, Breen C, et al: Buprenorphine maintenance versus placebo or methadone maintenance for opioid dependence. *Cochrane Database of Systematic Reviews* 2:CD002207, 2008
 35. Fareed A, Vayalappalli S, Casarella J, et al: Effect of buprenorphine dose on treatment outcome. *Journal of Addictive Diseases* 31:8–18, 2012
 36. Barnett PG, Rodgers JH, Bloch DA: A meta-analysis comparing buprenorphine to methadone for treatment of opiate dependence. *Addiction* 96:683–690, 2001
 37. Amato L, Minozzi S, Davoli M, et al: Psychosocial combined with agonist maintenance treatments versus agonist maintenance treatments alone for treatment of opioid dependence. *Cochrane Database of Systematic Reviews* 10:CD004147, 2011
 38. McCance-Katz EF, Sullivan LE, Nallani S: Drug interactions of clinical importance among the opioids, methadone and buprenorphine, and other frequently prescribed medications: a review. *American Journal on Addictions* 19:4–16, 2010
 39. Jones IIE, Heil SH, Baewert A, et al: Buprenorphine treatment of opioid-dependent pregnant women: a comprehensive review. *Addiction* 107(suppl 1):5–27, 2012
 40. Chiang CN, Hawks RL: Pharmacokinetics of the combination tablet of buprenorphine and naloxone. *Drug and Alcohol Dependence* 70(suppl):S39–S47, 2003
 41. Monte AA, Mandell T, Wilford BB, et al: Diversion of buprenorphine/naloxone coformulated tablets in a region with high prescribing prevalence. *Journal of Addictive Diseases* 28:226–231, 2009
 42. Schuman-Olivier Z, Albanese M, Nelson SE, et al: Self-treatment: illicit buprenorphine use by opioid-dependent treatment seekers. *Journal of Substance Abuse Treatment* 39:41–50, 2010
 43. Drummond DC, Perryman K: Psychosocial Interventions in Pharmacotherapy of Opioid Dependence: A Literature Review. London, St George's University of London, Division of Mental Health, Section of Addictive Behaviour, 2007
 44. Vital signs: risk for overdose from methadone used for pain relief - United States, 1999–2010. *Morbidity and Mortality Weekly Report* 61:493–497, 2012
 45. Fareed A, Vayalappalli S, Byrd-Sellers J, et al: Safety and efficacy of long-term buprenorphine maintenance treatment. *Addictive Disorders and Their Treatment* 10:123–130, 2011
 46. Friedmann PD, Hoskinson R, Gordon M, et al: Medication-assisted treatment in criminal justice agencies affiliated with the criminal justice-drug abuse treatment studies (CJ-DATS): availability, barriers, and intentions. *Substance Abuse* 33:9–18, 2012
 47. Kandall SR, Doberczak TM, Jantunen M, et al: The methadone-maintained pregnancy. *Clinics in Perinatology* 26:173–183, 1999
 48. Hulse GK, Milne E, English DR, et al: The relationship between maternal use of heroin and methadone and infant birth weight. *Addiction* 92:1571–1579, 1997
 49. Kaltenbach K, Berghella V, Finnegan L: Opioid dependence during pregnancy: effects and management. *Obstetrics and Gynecological Clinics of North America* 25:139–151, 1998
 50. Finnegan L, Kaltenbach K: Neonatal abstinence syndrome; in *Primary Pediatric Care*. Edited by Hoekelman RA, Friedman SB, Nelson NM, et al. St Louis, Mo, Mosby-Year Book, 1992
 51. Ebner N, Rohrmeister K, Winklbaur B, et al: Management of neonatal abstinence syndrome in neonates born to opioid maintained women. *Drug and Alcohol Dependence* 87:131–138, 2007
 52. Dashe JS, Sheffield JS, Olscher DA, et al: Relationship between maternal methadone dosage and neonatal withdrawal. *Obstetrics and Gynecology* 100:1244–1249, 2002
 53. McCarthy JJ, Leamon MH, Parr MS, et al: High-dose methadone maintenance in pregnancy: maternal and neonatal outcomes. *American Journal of Obstetrics and Gynecology* 193:606–610, 2005

hensive approaches to chronic pain into their scope of services.

Health care systems can incorporate nonjudgmental screening, brief intervention, and referrals for further assessment and treatment of addiction into all clinical settings where opioids are prescribed. Conversely, addiction-treatment providers can screen patients for pain, recognizing that inadequately treated pain is a risk factor for relapse.

Payers, including Medicare and state Medicaid programs, can use data-analysis tools to spot the red flags of inappropriate prescribing and refer prescribers to medical boards or other state agencies for further review, education, and oversight. Prescription-drug monitoring programs can also identify prescribers in need of assistance. Coherent, evidence-based review of clinical practice can be

 An audio interview with Dr. Olsen is available at NEJM.org

conducted with the aim of supporting high-quality care for both chronic pain and addiction — and avoiding the unintended consequence of deterring physicians from caring for patients with complex needs.

Public and private insurers can provide as generous coverage for treatment of opioid-use disorder as they do for management of chronic pain. This standard is infrequently met — for example,

it is long past time for Medicare to begin covering the effective care provided in opioid-treatment programs.

It is also time for the FDA to address the intertwining of chronic pain and addiction farther upstream in the drug-development cycle. The agency might consider creating a pathway for development and review of new products and indications for simultaneous treatment of chronic pain and opioid-use disorder. Building on its own work to advance the science of abuse-deterrent formulations, the FDA should also require that prescription opioids meet basic deterrent standards and should facilitate the gradual reformulation of existing products to meet such standards. In declining to apply such a standard to Zohydro, the agency noted that existing deterrent mechanisms have had minimal impact by themselves. However, even modest safeguards have been shown to reduce the potential for inappropriate use.⁵ As part of a comprehensive strategy, a set of reasonable requirements for opioid medications is well in line with the FDA's public health mission. Taking such action will deter others with less expertise from filling a perceived void.

In the end, pointing the finger at Zohydro is not going to resolve

the tension that exists today between chronic pain and addiction. All concerned about the treatment of chronic pain and all responding to the rise in overdose deaths need to come together to promote high-quality and effective prevention and treatment for both conditions.

Disclosure forms provided by the authors are available with the full text of this article at NEJM.org.

From the Institutes for Behavior Resources (Y.O.) and the Maryland Department of Health and Mental Hygiene (J.M.S.) — both in Baltimore.

This article was published on April 23, 2014, at NEJM.org.

1. Public health grand rounds — prescription drug overdoses: an American epidemic. Atlanta: Centers for Disease Control and Prevention, February 18, 2011 (<http://www.cdc.gov/about/grand-rounds/archives/2011/01-February.htm>).
2. Policy impact: prescription painkiller overdoses. Atlanta: Centers for Disease Control and Prevention, July 2, 2013 (<http://www.cdc.gov/HomeandRecreationalSafety/pdf/PolicyImpact-PrescriptionPainkillerOD.pdf>).
3. FDA Commissioner Margaret A. Hamburg statement on prescription opioid abuse. Silver Spring, MD: Food and Drug Administration, April 3, 2014 (<http://www.fda.gov/NewsEvents/Newsroom/PressAnnouncements/ucm391590.htm>).
4. Federation of State Medical Boards of the United States. Pain management policies: board by board overview. February 2014 (http://www.fsmb.org/pdf/GRPOL_Pain_Management.pdf).
5. Severtson SG, Bartelson BB, Davis JM, et al. Reduced abuse, therapeutic errors, and diversion following reformulation of extended-release oxycodone in 2010. *J Pain* 2013; 14:1122-30.

DOI: 10.1056/NEJMp1404181

Copyright © 2014 Massachusetts Medical Society.

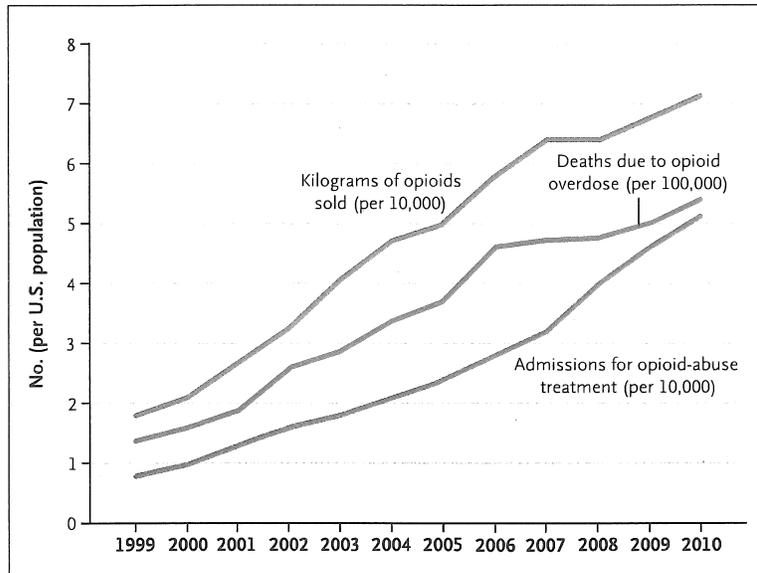
Medication-Assisted Therapies — Tackling the Opioid-Overdose Epidemic

Nora D. Volkow, M.D., Thomas R. Frieden, M.D., M.P.H., Pamela S. Hyde, J.D., and Stephen S. Cha, M.D.

The rate of death from overdoses of prescription opioids in the United States more than quadrupled between 1999 and

2010 (see graph), far exceeding the combined death toll from cocaine and heroin overdoses.¹ In 2010 alone, prescription opioids

were involved in 16,651 overdose deaths, whereas heroin was implicated in 3036. Some 82% of the deaths due to prescription



Opioid Sales, Admissions for Opioid-Abuse Treatment, and Deaths Due to Opioid Overdose in the United States, 1999–2010.

Data are from the National Vital Statistics System of the Centers for Disease Control and Prevention, the Treatment Episode Data Set of the Substance Abuse and Mental Health Services Administration, and the Automation of Reports and Consolidated Orders System of the Drug Enforcement Administration.

opioids and 92% of those due to heroin were classified as unintentional, with the remainder being attributed predominantly to suicide or “undetermined intent.”

Rates of emergency department visits and substance-abuse treatment admissions related to prescription opioids have also increased markedly. In 2007, prescription-opioid abuse cost insurers an estimated \$72.5 billion — a substantial increase over previous years.² These health and economic costs are similar to those associated with other chronic diseases such as asthma and HIV infection.

These alarming trends led the Department of Health and Human Services (HHS) to deem prescription-opioid overdose deaths an epidemic and prompted multiple federal, state, and local actions.² The HHS efforts aim to simultaneously reduce opioid abuse

and safeguard legitimate and appropriate access to these medications. HHS agencies are implementing a coordinated, comprehensive effort addressing the key risks involved in prescription-drug abuse, particularly opioid-related overdoses and deaths. These efforts focus on four main objectives: providing prescribers with the knowledge to improve their prescribing decisions and the ability to identify patients’ problems related to opioid abuse, reducing inappropriate access to opioids, increasing access to effective overdose treatment, and providing substance-abuse treatment to persons addicted to opioids.

A key driver of the overdose epidemic is underlying substance-use disorder. Consequently, expanding access to addiction-treatment services is an essential component of a comprehensive response.² Like other chronic dis-

eases such as diabetes and hypertension, addiction is generally refractory to cure, but effective treatment and functional recovery are possible. Fortunately, clinicians have three types of medication-assisted therapies (MATs) for treating patients with opioid addiction: methadone, buprenorphine, and naltrexone (see table). Yet these medications are markedly underutilized. Of the 2.5 million Americans 12 years of age or older who abused or were dependent on opioids in 2012 (according to the National Survey on Drug Use and Health conducted by the Substance Abuse and Mental Health Services Administration [SAMHSA]), fewer than 1 million received MAT.

When prescribed and monitored properly, MATs have proved effective in helping patients recover. Moreover, they have been shown to be safe and cost-effective and to reduce the risk of overdose. A study of heroin-overdose deaths in Baltimore between 1995 and 2009 found an association between the increasing availability of methadone and buprenorphine and an approximately 50% decrease in the number of fatal overdoses.³ In addition, some MATs increase patients’ retention in treatment, and they all improve social functioning as well as reduce the risks of infectious-disease transmission and of engagement in criminal activities. Nevertheless, MATs have been adopted in less than half of private-sector treatment programs, and even in programs that do offer MATs, only 34.4% of patients receive them.⁴

A number of barriers contribute to low access to and utilization of MATs, including a paucity of trained prescribers and negative attitudes and misunderstandings

Characteristics of Medications for Opioid-Addiction Treatment.			
Characteristic	Metadone	Buprenorphine	Naltrexone
Brand names	Dolophine, Methadose	Subutex, Suboxone, Zubsolv	Depade, ReVia, Vivitrol
Class	Agonist (fully activates opioid receptors)	Partial agonist (activates opioid receptors but produces a diminished response even with full occupancy)	Antagonist (blocks the opioid receptors and interferes with the rewarding and analgesic effects of opioids)
Use and effects	Taken once per day orally to reduce opioid cravings and withdrawal symptoms	Taken orally or sublingually (usually once a day) to relieve opioid cravings and withdrawal symptoms	Taken orally or by injection to diminish the reinforcing effects of opioids (potentially extinguishing the association between conditioned stimuli and opioid use)
Advantages	High strength and efficacy as long as oral dosing (which slows brain uptake and reduces euphoria) is adhered to; excellent option for patients who have no response to other medications	Eligible to be prescribed by certified physicians, which eliminates the need to visit specialized treatment clinics and thus widens availability	Not addictive or sedating and does not result in physical dependence; a recently approved depot injection formulation, Vivitrol, eliminates need for daily dosing
Disadvantages	Mostly available through approved outpatient treatment programs, which patients must visit daily	Subutex has measurable abuse liability; Suboxone diminishes this risk by including naloxone, an antagonist that induces withdrawal if the drug is injected	Poor patient compliance (but Vivitrol should improve compliance); initiation requires attaining prolonged (e.g., 7-day) abstinence, during which withdrawal, relapse, and early dropout may occur

about addiction medications held by the public, providers, and patients. For decades, a common concern has been that MATs merely replace one addiction with another. Many treatment-facility managers and staff favor an abstinence model, and provider skepticism may contribute to low adoption of MATs.⁴ Systematic prescription of inadequate doses further reinforces the lack of faith in MATs, since the resulting return to opioid use perpetuates a belief in their ineffectiveness.

Policy and regulatory barriers are another concern. A recent report from the American Society of Addiction Medicine describing public and private insurance coverage for MATs highlights several policy-related obstacles that warrant closer scrutiny. These barriers include utilization-management techniques such as limits on dosages prescribed, annual or lifetime medication limits, initial authorization and reauthorization

requirements, minimal counseling coverage, and “fail first” criteria requiring that other therapies be attempted first (www.asam.org/docs/advocacy/Implications-for-Opioid-Addiction-Treatment). Although these policies may be intended to ensure that MAT is the best course of treatment, they may hinder access and appropriate care. For example, maintenance MAT has been shown to prevent relapse and death but is strongly discouraged by lifetime limits.⁵

In addition, although Medicaid covers buprenorphine and methadone in every state, some Medicaid programs or their managed-care organizations apply the utilization-management policies described above. Most commercial insurance plans also cover some opioid-addiction medications — most commonly buprenorphine — but coverage is generally limited by similar policies, and access to care may be limited to in-network providers. Few private

insurance plans provide coverage for the depot injection formulation of naltrexone, and most do not cover methadone provided through opioid treatment programs.

Implementation of the Affordable Care Act (ACA) will increase access to care for many Americans, including persons with addiction. This expansion builds on the Mental Health Parity and Addiction Equity Act, which requires insurance plans that offer coverage for mental health or substance-use disorders to provide the same level of benefits that they do for general medical treatment. The ACA significantly extends the reach of the parity law’s requirements, ensuring that more Americans have coverage for mental health and substance-use disorders and that coverage complies with the federal parity requirements. These reforms present new opportunities for reducing prescription-opioid abuse and

its consequences by expanding the number of high-risk people who receive MATs through either public or private insurance. The importance of access to MATs and other treatment services for substance-use disorder is underscored by the recent recognition of increased heroin use; what may be less widely recognized is that the majority of these new heroin users initially abused prescription opioids before shifting to heroin.

A key driver of the overdose epidemic is underlying substance-use disorder. Consequently, expanding access to addiction-treatment services is an essential component of a comprehensive response.

HHS agencies are actively collaborating with public and private stakeholders in efforts to expand access to and improve utilization of MATs, in tandem with other targeted approaches to reducing opioid overdoses.² For example, the National Institute on Drug Abuse (NIDA) is funding research to improve delivery of MATs to vulnerable populations, including those in the criminal justice system. NIDA is also working to develop new pharmacologic treatments for opioid addiction and helping to fund “user friendly” delivery systems for naloxone (i.e., intranasal rather than injection). SAMHSA is encouraging MAT use in its state funding of substance-abuse treatment programs through the Substance Abuse Prevention and Treatment Block Grant and regulatory oversight of methadone and buprenorphine for opioid addiction. Furthermore,

SAMHSA supports production and dissemination of educational resources to MAT prescribers, as well as an “Opioid Overdose Toolkit” to educate first responders, treatment providers, and patients about ways to prevent and intervene in opioid-overdose cases.

The Centers for Disease Control and Prevention is working to empower states to implement comprehensive strategies, including MATs, for preventing prescription-drug overdoses. These strat-

egies focus primarily on addressing the overdose epidemic through enhanced surveillance, effective policies, and clinical practices that establish statewide prescribing norms. Such efforts can be enhanced by using data sources to identify and intervene in cases of patients or providers who fall outside those norms. And the Centers for Medicare and Medicaid Services is working to enhance access to MATs by Medicaid programs through improved benefit design and application of the Mental Health Parity and Addiction Equity Act. But to be successful, all these initiatives require the active engagement and participation of the medical community.

The epidemic of prescription-opioid overdose is complex. Expanding access to MATs is a crucial component of the effort to help patients recover. It is also necessary, however, to implement

primary prevention policies that curb the inappropriate prescribing of opioid analgesics — the key upstream driver of the epidemic — while avoiding jeopardizing critical or even lifesaving opioid treatment when it is needed. Essential steps for physicians will be to reduce unnecessary or excessive opioid prescribing, routinely check data from prescription-drug-monitoring programs to identify patients who may be misusing opioids, and take full advantage of effective MATs for people with opioid addiction.

Disclosure forms provided by the authors are available with the full text of this article at NEJM.org.

From the National Institute on Drug Abuse, National Institutes of Health, Bethesda (N.D.V.), the Substance Abuse and Mental Health Services Administration, Rockville (P.S.H.), and the Center for Medicaid and CHIP Services, Centers for Medicare and Medicaid Services, Baltimore (S.S.C.) — all in Maryland; and the Centers for Disease Control and Prevention, Atlanta (T.R.F.).

This article was published on April 23, 2014, and updated on May 1, 2014, at NEJM.org.

1. Jones CM, Mack KA, Paulozzi LJ. Pharmaceutical overdose deaths, United States, 2010. *JAMA* 2013;309:657-9.
2. Addressing prescription drug abuse in the United States: current activities and future opportunities. Atlanta: Centers for Disease Control and Prevention, 2013 (http://www.cdc.gov/homeandrecreationalafety/overdose/hhs_rx_abuse.html).
3. Schwartz RP, Gryczynski J, O'Grady KE, et al. Opioid agonist treatments and heroin overdose deaths in Baltimore, Maryland, 1995-2009. *Am J Public Health* 2013;103:917-22.
4. Knudsen HK, Abraham AJ, Roman PM. Adoption and implementation of medications in addiction treatment programs. *J Addict Med* 2011;5:21-7.
5. Clark RE, Baxter JD. Responses of state Medicaid programs to buprenorphine diversion: doing more harm than good? *JAMA Intern Med* 2013;173:1571-2.

DOI: 10.1056/NEJMp1402780

Copyright © 2014 Massachusetts Medical Society.



NIH Public Access

Author Manuscript

Published in final edited form as:

Curr Drug Abuse Rev. 2011 March 1; 4(1): 28–41.

Buprenorphine and Buprenorphine/Naloxone Diversion, Misuse, and Illicit Use: An International Review

Michael A. Yokell^{1,2}, Nickolas D. Zaller^{*,1,2,3}, Traci C. Green^{2,3,4}, and Josiah D. Rich^{1,2,3}

¹Division of Infectious Diseases, The Miriam Hospital, Providence, RI 02906, USA

²Center for AIDS Research, The Miriam Hospital, Providence, RI 02906, USA

³Warren Alpert Medical School of Brown University, Providence, RI 02912, USA

⁴Rhode Island Hospital, Providence, RI 02903, USA

Abstract

The diversion, misuse, and non-medically supervised use of buprenorphine and buprenorphine/naloxone by opioid users are reviewed. Buprenorphine and buprenorphine/naloxone are used globally as opioid analgesics and in the treatment of opioid dependency. Diversion of buprenorphine and buprenorphine/naloxone represents a complex medical and social issue, and has been widely documented in various geographical regions throughout the world.

We first discuss the clinical properties of buprenorphine and its abuse potential. Second, we discuss its diversion and illicit use on an international level, as well as motivations for those activities. Third, we examine the medical risks and benefits of buprenorphine's non-medically supervised use and misuse. These risks and benefits include the effect of buprenorphine's use on HIV risk and the risk of its concomitant use with other medications and drugs of abuse. Finally, we discuss the implications of diversion, misuse, and non-medically supervised use (including potential measures to address issues of diversion); and potential areas for further research.

Keywords

Buprenorphine; buprenorphine/naloxone; diversion; injection drug use; self treatment; Suboxone; Subutex; opioid dependence; opioid abuse; opiate abuse; opiate dependence

INTRODUCTION

Opioid Dependence: Extent of the Problem

Opioid abuse and dependence are major medical and social concerns throughout the world, contributing to excessive morbidity, mortality, disability, and economic costs [1, 2]. The United Nations Office on Drugs and Crime notes that opiates, particularly heroin, are the main problem drugs at a global level, with an estimated 15.6 million opioid abusers globally, including approximately 11.1 million heroin abusers [3]. The WHO also estimates that there are approximately 12.6 million injection drug users (IDUs) in the world [4], with injection drug use reported in over 150 countries and territories globally [5]. While the prevalence of

© 2011 Bentham Science Publishers Ltd.

*Address correspondence to this author at The Miriam Hospital, 164 Summit Avenue, RISE/CFAR Rm. 109, Providence, RI 02906, USA; Tel: 401-793-4875; Fax: 401-793-4861; nzaller@lifespan.org.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

injection drug use may be low in any given general population, IDUs represent a major point of entry for HIV into a population; according to UNAIDS, injection drug use accounts for up to 80% of HIV infections in Eastern Europe and Central Asia [6].

In addition to the risk of HIV infection and transmission, other harms associated with injection drug use present additional medical challenges. Unsafe injection practices have contributed to an international epidemic of Hepatitis C virus, with an estimated 120 million people infected worldwide [7]. Abscesses, endocarditis, and soft tissue infections are prominent concerns for the health of IDUs [8–10]. Finally, regular use of opioids, regardless of the route of administration, results in lasting biological and physiological changes in the brain, including disruptions in inhibitions, motivation, and decision-making processes [11].

Opioid replacement therapy with methadone or buprenorphine is a clinically effective treatment for opioid dependence. Methadone was first used to treat opioid dependence in the 1960's [12]. It is a synthetic full mu-receptor agonist that is usually administered to patients orally on a daily basis for opioid replacement [13]. Buprenorphine, which is described in greater detail below, is a partial mu-agonist that is administered sublingually to patients undergoing opioid substitution therapy [13]. Studies examining the effectiveness of opioid substitution treatment have found that it results in superior retention rates (in comparison to abstinence only treatment) [14], reduces the amount of illicit and nonprescribed opioids used by patients [12, 14–16], decreases criminal activity [14, 17], and helps to reduce the transmission of HIV among drug users and the occurrence of high-risk injection practices [14, 17–19].

While the ultimate goal of substance abuse treatment is abstinence, opioid addiction is a chronic, relapsing medical condition. In this article, we take a harm reduction approach to analyze the use of buprenorphine and buprenorphine/naloxone by opioid users.

Buprenorphine - Course of Action, Safety, and Clinical Efficacy

Buprenorphine is a relatively long-acting partial mu agonist and full kappa antagonist administered sublingually in opioid replacement therapy [13, 20, 21]. Buprenorphine is commonly sold alone (Subutex[®]) or in a coformulation with naloxone (Suboxone[®]) to prevent parenteral abuse [13, 22–25]. As a partial agonist, buprenorphine exhibits a ceiling effect at high doses. This means that there is a plateau observed for buprenorphine's opioid agonist effects, such as sedation and respiratory depression, even at high doses. In experimental settings, doses up to 70 times the recommended analgesic dose were well tolerated in non-dependent males who had previous experience with opioids [20].

Buprenorphine was first used at low doses as an analgesic for post-operative and cancer patients in the late 1970s [26, 27]. Shortly thereafter, reports of buprenorphine misuse—marketed at the time as Tamgesic[®]—began to surface in New Zealand [28] and reports of injection misuse arose in Europe [29]. A recent report from the World Health Organization Expert Committee on Drug Dependence noted that, while diversion is currently occurring and does pose a public health concern, the risk-to-benefit ratio for the continued use of buprenorphine is favorable [30].

High-dose buprenorphine—available in 0.4mg, 2.0mg, and 8.0mg doses—was introduced in 1980 for the treatment of opioid dependency [31–33]. Buprenorphine is a well-suited medication for opioid replacement therapy due to its activity as a partial opioid agonist. Buprenorphine can be substituted for full agonists, such as heroin or morphine, to prevent withdrawal but it can also be slowly withdrawn without large discomfort, as is often experienced with methadone [34].

Numerous trials and reviews have established buprenorphine as an effective treatment for opioid dependence. Buprenorphine is safe and effective for use in acute detoxification, stabilization, and long-term maintenance of individuals with opioid dependence. In a randomized controlled trial of buprenorphine, Johnson and colleagues found that buprenorphine was effective in maintaining patients in treatment and reducing the consumption of illicit opioids [35]. Additional studies have shown that office-based treatment (OBT) with buprenorphine is effective and safe for the treatment of opioid dependency [36, 37]. Office-based therapy provides additional benefits, including minimization of contact with other drug users and of the stigma associated with drug dependence [21, 38]. As a result of buprenorphine and buprenorphine/naloxone's safety profiles, the U.S. National Institute on Drug Abuse has identified the medication as a first-line treatment for opioid dependence [39]. The WHO also added buprenorphine as a complementary medication to the 14th edition of The Model of List of Essential Medicines [4].

Buprenorphine is intended for sublingual administration. Due to extensive first-pass liver metabolism, oral dosing of buprenorphine results in low bioavailability and is not feasible. With sublingual administration, the medication achieves sufficient bioavailability after being dissolved under the tongue, usually within 5–7 minutes of administration. Buprenorphine/naloxone is also intended for sublingual dosing, and while the sublingual bioavailability of buprenorphine is relatively high (ca. 35–55%), that of naloxone is low (ca. 10%); this property allows the combination buprenorphine/naloxone product to deliver the effects of the opioid without those of the antagonist, when used as directed [24, 40, 41]. If buprenorphine/naloxone is injected, however, the bioavailability of naloxone is high; in such an instance, the naloxone component is intended to both precipitate withdrawal and block the euphoric/analgesic effects of buprenorphine in opioid-dependent individuals [25]. However, at the current 4:1 buprenorphine/naloxone coformulation ratio, the naloxone component does not significantly reduce the effects of buprenorphine when the combination product is injected by individuals who are not dependent on opioids [42]. Thus, buprenorphine/naloxone is intended to reduce the risk of abuse *via* injection [22–25].

Although the analgesic properties of buprenorphine and its potential indication for pain management were documented as early as the 1970's, new research has examined buprenorphine's role in chronic pain management, post-operative pain management, and non-cancer pain management. In particular, the efficacy and safety of transdermal buprenorphine has been studied with positive results. Transdermal buprenorphine was studied with chronic osteoarthritis patients, demonstrating good efficacy and tolerability [43], and was also studied in a randomized controlled trial for chronic low back pain, where it was effective at managing pain in patients who had previously received opioids [44]. The use of sublingual buprenorphine for pain management has also been studied, with the medication showing a high degree of efficacy, tolerability, and safety in patients with chronic pain syndrome, even in individuals who suffer from opioid addiction [45]. In a double-blind comparison of sublingual and transdermal buprenorphine in patients with osteoarthritis pain, both forms showed similar efficacy, and transdermal buprenorphine demonstrated better tolerability among patients [46]. Although buprenorphine has not been extensively used in clinical practice for pain management, current evidence suggests that buprenorphine may be well-suited for pain management, particularly in high-risk patients, such as diabetics, the elderly, or individuals with renal failure, due to buprenorphine's good safety profile, ceiling effect on respiratory depression, low incidence of adverse events, and pharmacokinetics that are unaltered by age or renal function [47].

Buprenorphine is currently used in dozens of countries throughout the world for the treatment opioid dependence and, in some instances, for pain management. Dosing policies,

access to treatment, levels of patient supervision, and government policies vary widely among individual countries.

Since 1995, all primary care physicians in France have been able to prescribe buprenorphine to patients suffering from opioid dependence. Physicians in France are not required to undergo any specific training to prescribe buprenorphine and do not have any limits on the number of patients who may receive buprenorphine [48]. In that country, HIV prevalence and rates of fatal opioid overdose among IDUs have dropped significantly since the widespread introduction of buprenorphine [31]. By 2006, approximately 95,000 patients were receiving buprenorphine for the treatment of opioid dependence in France [49].

The United States was the first country to widely use combination buprenorphine/naloxone (Suboxone[®]) for office-based treatment (OBT) of opioid dependence. Under provisions of the US Drug Abuse Treatment Act of 2000 (DATA 2000), any physician can undergo a training course and subsequently apply for a license to prescribe buprenorphine/naloxone to individuals with opioid dependence on an out-patient basis [48]. Each physician is initially limited to 30 patients, but can later apply to prescribe buprenorphine/naloxone to a maximum of 100 patients [48].

Buprenorphine was approved in Australia in 2000 for detoxification and maintenance of opioid-dependent patients [50, 51]. Patients commonly receive their dose of buprenorphine in a pharmacy or community clinic, where the pharmacist or a staff member directly administers the medication on-site, usually waiting 3–5 minutes before staff inspect the patient's oral cavity [52]. Buprenorphine/naloxone (Suboxone[®]) was approved for the treatment of opioid dependence in 2005 [51].

Buprenorphine was first introduced in India in 1986 as an analgesic (Tidigesic[®]), and reports of buprenorphine ampoule abuse were reported shortly thereafter [53]. Buprenorphine was approved for the treatment of opioid dependence in India in 1999 [54]. In Malaysia, buprenorphine was first licensed for prescription in 2003, and was not highly regulated. Consequently, reports of abuse quickly emerged and, in 2006, buprenorphine/naloxone was introduced to replace buprenorphine in the Malaysian market with the aim of decreasing the practice of buprenorphine injection [55].

Abuse Potential of Buprenorphine

Several studies have examined the reinforcing effects and abuse potential of buprenorphine. Buprenorphine administration in non-opioid dependent individuals produces the euphoric effects typically associated with opioids [56, 57]. Subsequent research has demonstrated that buprenorphine does exhibit positive-reinforcement properties, similar to other opioids [58–60]. For example, in a study conducted by Comer *et al.*, participants received a dose of buprenorphine, buprenorphine/naloxone, or placebo and \$20, and were subsequently allowed to choose between a dose or \$20 in a choice session; those who received the actual medication were more likely to self-administer another dose in comparison to those receiving the placebo [58]. Another evaluation of buprenorphine in detoxified males with heroin dependence produced significant euphoria in the participants, but the abuse liability was considered moderate in comparison to morphine [61]. The abuse potential for buprenorphine is generally considered to be less than that of full opioid agonists [62, 63]. Collectively, these data indicate that there is some cause for concern regarding initiation of opioid misuse with buprenorphine, although this risk is lower than that of most other opioids.

In opioid-dependent individuals, sublingual or parenteral administration of buprenorphine may precipitate withdrawal and/or limit the reinforcing effect of full agonist opioids, due to

its properties as a high-affinity partial agonist [30, 64–68]. Therefore, due to buprenorphine's mixed agonist-antagonist properties, several studies have concluded that the risk of buprenorphine abuse among opioid-dependent individuals is relatively low [31, 58, 69].

A direct comparison of the prevalence of buprenorphine and buprenorphine/naloxone abuse is difficult, since each product was introduced into different locations at different times. For example, in the United States, the monoproduct was never extensively used before the introduction of the combination product, and heroin remains cheap and highly accessible on the street. As a result, buprenorphine is not a major drug of abuse in the US. On the contrary, in many European and Asian countries, buprenorphine monoproduct was available for years before the introduction of the coformulated product, and limited heroin availability may have prompted IDUs to make buprenorphine their primary drug, especially in regions where buprenorphine was not highly regulated. Thus, the overall prevalence of buprenorphine or buprenorphine/naloxone abuse is not simply a function of the biological properties of these medications, but rather is dependent on a variety of social, cultural, political, and economic forces.

BUPRENORPHINE DIVERSION AND ILLICIT USE

Diversion and Illicit Use of Buprenorphine

Buprenorphine abuse by injection was first recorded in the mid-1980s [28, 29]. In the last two-and-a-half decades, buprenorphine diversion and illicit use have been documented in countries around the world. In some countries, such as Finland, buprenorphine is the most widely abused opioid, whereas its abuse in other nations exists to a much lesser extent. Regardless of the location, various studies, which will be explored further in this section, have identified motivations for illicit use and abuse. Table 1 displays information from a selection of relevant studies examining buprenorphine diversion from various geographical locations. The studies displayed in Table 1 represent articles on buprenorphine diversion that were published within the last 10 years. The goal of this table is not to be an exhaustive list of studies; instead it illustrates the range of geographic locations where buprenorphine diversion has been noted, along with relevant findings to demonstrate the range of diversion levels in diverse geographical settings.

Since buprenorphine's widespread introduction in France for the treatment of opioid dependence in 1995, illicit use and misuse of buprenorphine have been widely documented. One study reported up to 20% of buprenorphine patients were misusing their prescription intravenously [31] (see Table 1). Another French study found that 27% of IDUs were exclusive buprenorphine injectors, with another 37% reporting polydrug use [70]; some of these IDUs may have purchased their buprenorphine from individuals with a prescription [71], while others may have obtained buprenorphine by altering or forging prescriptions [63, 72, 73]. Obadia *et al.* reported similar findings, with 24% of their IDU sample reporting exclusive buprenorphine use and 34% reporting polydrug use with buprenorphine [74]. While injection of buprenorphine remains the most commonly reported route of administration for misuse of the medication, sniffing has also been reported in France [75] and elsewhere [76].

In Finland, buprenorphine, which has been used for pain management since 1997 and was introduced in 2002 for the treatment of opioid dependence, is the most commonly abused drug by IDUs and the most commonly abused opioid [77, 78]. A sharp increase in the misuse of buprenorphine coincided with a notable decrease in 2001 in the availability of heroin in Finland [77]. Among those entering treatment for opioid dependence, Aalto *et al.* found that 29 of 30 patients (97%) reported buprenorphine as their primary drug of abuse

[77]. Among a larger sample of syringe exchange program (SEP) participants in Finland (n=176), buprenorphine was the most frequently abused injection drug (73% of respondents), yet a significant portion of these individuals reported using buprenorphine in a therapeutic manner, to self-treat withdrawal or addiction [79] (see Table 1). Elsewhere in Europe, illicit buprenorphine use has been reported in Sweden [80], Scotland [81, 82], Norway [83], Ireland [84], and Spain [85].

Numerous studies have examined the issue of misuse and non-medically supervised use of buprenorphine in Australia, where the medication is strictly regulated. Buprenorphine was introduced in Australia in 2000, followed by the introduction of buprenorphine/naloxone in 2006 in response to concerns of buprenorphine diversion and illicit use [86]. In two separate studies, about 1/3 of IDUs reported recent buprenorphine injection [87, 88] (see Table 1); however, buprenorphine was the primary drug of abuse in only about 10% of IDUs [87]. A significant proportion of primary buprenorphine injectors had a prescription for the medication [87]. In a cross-sectional study of clients receiving buprenorphine in public clinics, about one-quarter (26.5%) had ever injected buprenorphine and most patients reported wanting to take their medication as prescribed [50] (see Table 1). Buprenorphine diversion by patients receiving supervised dosing at pharmacies has also been reported in Australia, which often occurs when patients remove the tablet before it is fully dissolved [89, 90]. In a recent study with 440 patients receiving opioid substitution therapy (methadone, buprenorphine, or buprenorphine/naloxone), Horyniak and colleagues found that 18% of their Australian participants ever inhaled buprenorphine or buprenorphine/naloxone, with smoking being the most common form of inhalation, while rates of buprenorphine and buprenorphine/naloxone snorting were relatively low. While lifetime rates of inhalation were relatively high, rates of recent inhalation were low. The authors postulated that these rates may indicate experimentation and not chronic use, and also propose that inhalation may represent a harm reduction approach to reduce the use of injectable opioids [86].

In the United States, buprenorphine was approved for analgesic use (Buprenex[®]) in 1985 as a Schedule V Medication. Buprenorphine (Subutex[®]) and buprenorphine/naloxone (Suboxone[®]) were introduced for office-based treatment of opioid dependence in 2002 as Schedule III Medications [91]. Buprenorphine/naloxone is a first-line option for office-based treatment, with the buprenorphine monoproduct used occasionally for the induction phase [92, 93]. The SAMHSA (Substance Abuse Mental Health Services Administration) Consensus Panel on Buprenorphine recommends that buprenorphine/naloxone be used for the induction, stabilization, and maintenance of most patients in the United States [94]. Currently, approximately 15,700 physicians can prescribe buprenorphine for the treatment of opioid dependence, with an estimated 3.5M prescriptions written for buprenorphine or buprenorphine/naloxone in 2008 [91]. Low levels of abuse have been detected since the medications' introduction, with buprenorphine and buprenorphine/naloxone generally ranked as the least-abused or misused opioid among those studied (examples of other opioids with higher rates of abuse in the U.S. include heroin, oxycodone, hydrocodone, methadone, morphine, and fentanyl) [95–99]. Buprenorphine/naloxone diversion has been limited and illicit buprenorphine/naloxone—which is frequently acquired from individuals with prescriptions—is commonly used in a therapeutic, non-medically supervised manner [33, 100, 101] (see Table 1).

In 2006, the Malaysian government replaced buprenorphine, which was introduced in 2001 [102], with buprenorphine/naloxone to address concerns of buprenorphine misuse and injection [55]. After the transition to buprenorphine/naloxone, there was no reduction in injection risk behaviors among IDUs, but an increase in their use of benzodiazepines [55] (see Table 1). The concomitant use of benzodiazepines has been identified elsewhere, and

has been attributed to an increase in euphoric effects of buprenorphine [53], although further investigation into the exact motivations for the concomitant use of buprenorphine and benzodiazepines is warranted. In some areas, benzodiazepines may be available over-the-counter, which may increase rates of concomitant use with buprenorphine. Despite reported withdrawal symptoms, IDUs did not decrease their self-administration of buprenorphine/naloxone [55]. In another Malaysian study, a large majority of buprenorphine IDUs reported lifetime (ca 100%) or current (ca 63%) heroin use [64] and many buprenorphine/naloxone injectors had developed methods to avoid the effects of naloxone, which included dividing the tablets into small pieces or mixing it with heroin or benzodiazepines [64]. Reports of buprenorphine abuse in India indicate that the use of street-acquired buprenorphine is common among heroin injectors [103]. Recent studies identified buprenorphine as the second most commonly injected drug (after heroin) in India, and also raised concern over the number of new IDUs who initiate injection with buprenorphine [104].

MOTIVATIONS FOR BUPRENORPHINE DIVERSION AND INJECTION

Motivations for Buprenorphine Injection

While the practice of diverting buprenorphine has been established in many regions throughout the world, few studies have examined the motivating factors for such diversion. Several publications, which are explored below, have identified price, withdrawal management, insufficient dosing, a lack of other drugs, and a pursuit of euphoria as possible motivations.

Price—In some regions, buprenorphine is cheaper than heroin when obtained legitimately for pharmacotherapy or when illicitly purchased on the streets [87]. In some instances, rising prices of other injectables may influence a transition to buprenorphine [33, 105, 106] or the lower price of buprenorphine may appeal to injectors who have limited income [84]. Additionally, the decision to inject buprenorphine may also be influenced by cost, as smaller doses can be used in comparison to sublingual dosing [64, 107]. Indeed, injection use of buprenorphine is the most biologically efficient route of administration (in terms of bioavailability) [108–111], with smaller IV doses required to obtain euphoric effects in comparison to other routes of administration. Although this efficiency may initially appear more economical, an individual who injects buprenorphine will quickly develop a level of tolerance that could ultimately result in greater consumption of buprenorphine.

Depending on the geographic region and the degree of availability of illicit buprenorphine, the medication may be significantly less expensive than comparable doses of other opioids. In other cases, heroin may be adulterated or hard to acquire. All of these conditions may contribute to the acquisition and use of illicit buprenorphine [84, 87, 105, 106, 112].

Euphoria—In any area with accessible buprenorphine, some level of diversion and abuse is to be expected, as is the case with all opioid medications. In various studies, rates of euphoria seeking, or using buprenorphine to “get high” range from 10% in some regions of Australia to 97% in Finland [79, 87] (see Table 1). As illustrated by the “Diversion and Illicit Use of Buprenorphine” section of this article, buprenorphine abuse rates vary widely across different geographic regions.

Illicit Use as a Response to Sub-Optimal Clinical Dosing or Due to a Lack of Other Drugs—In some instances, patient misuse of buprenorphine by injection or inhalation may be indicative of sub-optimal clinical dosing [74, 75, 113]. In such cases, patients may not be receiving an adequate dose of buprenorphine, may be attempting to maintain the clinical effects of buprenorphine while using less medication (for instance, due to financial constraints), or may be diverting some of their medication to others (for

therapeutic purposes or for misuse) while still attempting to maintain buprenorphine's therapeutic effects.

Other Motivations for Buprenorphine Diversion

Studies examining buprenorphine diversion and illicit use have identified additional motivations for such behavior. In Singapore, for example, Chong *et al.* note that there is a false belief among IDUs that intravenous administration of buprenorphine can enhance erection [107]. In India, where buprenorphine was introduced as an ampoule analgesic in 1986, one study found that buprenorphine users, who constitute about 30% of all IDUs [104], were less likely to face threats of arrest in comparison to heroin users, that buprenorphine users believed they were less likely to be harassed by the police if they possessed buprenorphine rather than heroin, and that buprenorphine users generally only had minor histories of arrest and incarceration [114] (see Table 1). In another Indian study, an association was found between intensified police presence and increased injection of buprenorphine in comparison to the injection of heroin [106]. Collectively, these data indicate that law enforcement efforts may influence the drug use profiles of a population and may inadvertently encourage drug-dependent individuals to utilize forms of drugs that outwardly appear less illegal. Additionally, police enforcement in a particular area may affect the availability of particular forms of opioids, which could prompt opioid-dependent individuals to switch to other opioids that have greater local availability.

MEDICAL RISKS AND BENEFITS OF NON-MEDICALLY SUPERVISED BUPRENORPHINE USE

Medical Benefits of Non-Medically Supervised Buprenorphine Use

While there are public health, medical, social, and legal concerns regarding the misuse and illicit of buprenorphine, studies have identified various benefits of illicit buprenorphine use. In many instances, individuals using illicit buprenorphine may be doing so in an attempt to decrease the illicit use of other opioids, to self-treat opioid dependence, to manage or mitigate withdrawal symptoms [33, 80, 100, 108], or to attempt to reduce the level of harm associated with injection drug use [114] (see Table 1). Similarly, studies that examined differences between buprenorphine and non-buprenorphine IDUs have noted safer injection practices and lower rates of high-risk HIV activity among buprenorphine injectors [114, 115].

For example, in a recent study in the Republic of Georgia, where buprenorphine is an unregistered medication, only 13% of IDUs recruited from a needle exchange reported that buprenorphine was their drug of choice, while 42% reported using buprenorphine to cope with withdrawal symptoms and 6% used buprenorphine to stop using other drugs [116].

In the United States, a study examining entrants to office-based opioid treatment reported that a large majority of patients had used non-medically supervised buprenorphine to prevent cravings and to prevent the onset of withdrawal symptoms [33] (see Table 1). In a qualitative study in Massachusetts and Vermont, treatment seekers also frequently reported using illicit buprenorphine and similar results were found, with patients indicating non-medically supervised buprenorphine use to prevent withdrawal and to self-treat withdrawal symptoms [100]. A 2009 U.S. study examining the use of illicit buprenorphine among out-of-treatment injection and non-injection drug users found that a majority of participants used the medication to reduce opioid withdrawal symptoms and to self-treat opioid addiction, with more IDUs than non-IDUs reporting buprenorphine use for these purposes. That same study also noted that about three quarters of IDUs and half of non-IDUs used diverted

buprenorphine because they could not afford to enter formal drug treatment [101] (see Table 1).

Additional data from Hakansson *et al.* reported in 2007 showed that a majority of surveyed heroin users (89%) in Sweden reported buprenorphine use in their lifetime, and that among those illicit users, 87% were using buprenorphine therapeutically, for self-detoxification or withdrawal treatment. In that same study, sublingual administration of illicit buprenorphine was most common, consistent with the medication's intended mode of administration [80].

In Malaysia, Bruce *et al.* found that injectors were using diverted buprenorphine as a treatment modality, frequently reporting non-medically supervised buprenorphine use to avoid heroin or morphine withdrawal. Participants also reported subjective improvements in quality of life after transitioning to buprenorphine. Buprenorphine use often allowed these users to obtain and sustain employment, which they were unable to do while injecting heroin [108].

HIV Risk Behavior and Illicit Buprenorphine

Few studies have examined the associations between non-medically supervised buprenorphine use and HIV risk behavior. Sullivan *et al.* found that office-based buprenorphine treatment in the U.S. was associated with decreased drug-related HIV risk behavior, including decreased injection drug use and decreased needle sharing among in-treatment participants [115]. It is possible that non-medically supervised buprenorphine users experience similar benefits. In India, Kumar *et al.* noted that illicit buprenorphine injectors were less likely to share injection equipment and had fewer drug using members in their social networks [114], which could potentially have a significant impact on injection drug-related risk of HIV infection. Likewise, in France, individuals who exclusively inject buprenorphine reported lower rates of needle sharing and polydrug use, while simultaneously having higher rates of employment in comparison to heroin or cocaine injectors [31]. Higher rates of employment among exclusive buprenorphine injectors may indicate that buprenorphine injectors have more stable living situations, possibly due to a lower severity of addiction, than their heroin- and cocaine-injecting counterparts. What is not known is whether this is a function of the drug itself or of the type of drug user who uses buprenorphine by injection.

Medical Risks of Illicit Buprenorphine Use

Despite the therapeutic benefits of non-medically supervised buprenorphine use, concerns regarding the misuse of diverted buprenorphine, particularly when administered *via* injection, should also be considered. Adverse events associated with buprenorphine injection are similar to those of other injected substances. There have been several reports of abscesses, soft tissue infections, emboli, acute limb ischaemia, endocarditis, sepsis, and HIV and Hepatitis C infection associated with injection of buprenorphine [9, 31, 107, 117, 118]. Also, in areas where supervised sublingual dosing of buprenorphine occurs, subsequent injection of the partially dissolved medication may pose a high risk of microbiological contamination [87], as microbial flora from a patient's mouth may be present on the tablet that will later be injected.

Another concern that arises with the diversion of buprenorphine is the potential that the medication may be used by individuals experimenting with illicit substances, by individuals initiating injection administration of drugs, or by individuals who are initiating opioid use [80, 81]. In Georgia, 11.5% of IDUs reported that buprenorphine was their first drug of dependence [116], and in France, data suggest that the introduction of buprenorphine may have contributed to polydrug use among existing injectors [74]. In a recent study in India,

new initiates of injection were more likely to inject buprenorphine than heroin, which may be explained by the relatively recent introduction of buprenorphine to that country [104], in comparison to other opioids, such as heroin, that have been available for many decades. These data on initiation of injection with buprenorphine in India may be indicative of the social acceptability of injecting a prescription medication (buprenorphine), as opposed to a totally illicit drug (heroin), may indicate changes in the general social acceptability of injection drug use, and/or may reflect the simple fact that buprenorphine was not available when older IDUs first started injecting opioids. Further research is needed to understand buprenorphine's role in the initiation of injection drug use in India. In contrast, in a study of a national sample of drug users in the United States conducted by some of the authors of this review, initiation of injection was rare with buprenorphine and co-initiation of heroin use and buprenorphine was also rare, especially compared to other prescription opioids that were more commonly co-initiated (methadone pills, hydromorphone, oxycodone) [119].

In comparison to other opioids, the risks associated with buprenorphine diversion are relatively low. Data indicate that primary buprenorphine injectors do not inject more frequently than heroin injectors [87] and the euphoric effects of buprenorphine are low in comparison to full agonists like heroin, oxycontin, hydrocodone, morphine, or methadone [67, 120, 121]. In comparison to non-prescription opioids (like heroin), buprenorphine allows users to know the precise dose they are taking and minimizes the risks of other agents that may be introduced into non-prescription opioids [87].

Collectively these studies examining the risk profiles of buprenorphine users demonstrate that there is no reason to conclude that buprenorphine users experience any greater risk of HIV infection or transmission than other IDUs. It is entirely probable that buprenorphine injectors are at lower risk of HIV infection due to safer injection practices. This may be the result of less severe withdrawal (in comparison to full agonists) [41] or the long duration of buprenorphine's effects [122], which may consequently elicit less desperation, could provide the user with more time to obtain and prepare the next injection, and may result in a lower degree of willingness to engage in risky behavior. Further research is needed to assess relative risks of HIV infection for buprenorphine injectors and other IDUs, and to differentiate between the effects of buprenorphine on HIV transmission and the characteristics of buprenorphine injectors that may put them at a decreased risk of HIV infection.

Concomitant Drug Use and Overdose with Buprenorphine

Concomitant drug use with buprenorphine can present unique medical concerns for the user, particularly when buprenorphine is combined with benzodiazepines. Overdoses caused solely by buprenorphine are rare [123], with most overdoses occurring when the medication is used concomitantly with benzodiazepines or other sedatives [31, 37] (see Table 1). Despite reports of overdoses involving buprenorphine and benzodiazepines, rates of overdose have declined by 79% since the introduction of buprenorphine in France [31] and buprenorphine-related deaths in France, when recorded, are commonly among out-of-treatment (illicit) buprenorphine users [124].

It is important to note that rates of opioid overdose with buprenorphine are significantly lower than those associated with methadone [123], due in part to buprenorphine's ceiling effect, action as a partial agonist, and limited respiratory depression [20]. A study examining the relative rates of buprenorphine and methadone deaths in France found that the death rate attributable to methadone was at least three times greater than that of buprenorphine; the authors estimated that if all French buprenorphine patients had been treated with methadone instead of buprenorphine, there would have been approximately 288 deaths from 1994 to

1998, compared to the 46 deaths that occurred while those patients were in buprenorphine treatment [125].

DISCUSSION

Is There Sufficient Evidence to Conclude That Buprenorphine Diversion is a Problem?

Numerous studies have documented the presence and, in some instances, the extent of buprenorphine diversion in varying locations around the world. Although the phenomenon of buprenorphine diversion is now well established, the literature still lacks a complete explanation and understanding of the motivations for diversion, therapeutic applications of diverted buprenorphine, and the sources of illicit buprenorphine. As with other abuseable medications, in any location where buprenorphine is available, diversion will likely occur. However, discussions of diversion should be broadened beyond the risks or legal implications associated with this activity. Strong consideration should also be given to the medical, social, public health, and economic benefits that arise when opioid-dependent individuals use buprenorphine in a therapeutic manner to self-treat addiction and withdrawal symptoms or as a harm reduction approach to manage the risks associated with drug dependence. Any consideration of diversion should balance the overall benefits—both those seen in clinical patients as well as those seen in illicit users—with the potential harms.

Do the Benefits of Buprenorphine Outweigh the Risks?

As demonstrated in this review article, buprenorphine has the potential to be a drug of abuse, and is indeed the major drug of abuse in some geographical areas. Simultaneously, the clinical efficacy of buprenorphine for the treatment of opioid dependency has been established, and hundreds of thousands of patients have benefited from its clinical applications and accessibility. Furthermore, evidence presented in this review indicates that non-medically supervised buprenorphine is frequently used in a therapeutic manner to self-treat opioid addiction or withdrawal symptoms in individuals who cannot otherwise access substance abuse treatment, or who do not want to do so. Illicit use of buprenorphine by IDUs may also represent a harm reduction approach to reduce the consumption of other opioids, including the injection use of heroin. Additionally, misuse of buprenorphine—such as improper dosing, inhalation, or injection—among patients enrolled in buprenorphine treatment may be a sign of insufficient dosing or dissatisfaction with care. Such episodes of noncompliance may represent an opportunity for providers to adjust opioid substitution treatment to better meet the needs of buprenorphine patients.

The relative benefits and risks of buprenorphine should also be compared to those of other opioids. The abuse liability of buprenorphine and its potential for overdose mortality are less than that of full opioid agonists [61, 62, 94]. Additionally, buprenorphine precipitates withdrawal when used by opioid-dependent individuals who have other opioids in their systems, even if the buprenorphine is not coformulated with naloxone [94].

Finally, buprenorphine's appeal to individuals with opioid addiction is an important reason to maintain and expand access to buprenorphine. Participants in several studies have expressed greater interest in engaging in buprenorphine and continuing buprenorphine treatment in comparison to methadone, have stated that they would only access buprenorphine and would not utilize methadone, and have stated a desire to switch from methadone treatment to buprenorphine treatment if possible [126, 127]. These studies collectively demonstrate the appeal of buprenorphine to many opioid-dependent individuals and indicate the need for accessible, community-based buprenorphine treatment.

Should There be Tighter Control/Monitoring of Buprenorphine?

Tighter controls on buprenorphine will likely increase barriers encountered by opioid-dependent individuals as they seek treatment, may force “black market” sales of buprenorphine into more reclusive and dangerous settings, and may result in the sale of tainted or counterfeit medications to individuals who are seeking illicit buprenorphine for therapeutic purposes. Thus, any increases in control or monitoring should be considered in parallel with efforts to increase access to affordable and sustainable opioid substitution therapy for dependent individuals.

Prescription monitoring programs (PMPs), which allow clinicians and pharmacists to conduct real-time database queries in order to verify a patient’s medication dosing and detect prescription alteration and “doctor shopping”, present one opportunity to approximate levels of buprenorphine diversion and misuse. PMPs have the potential to alert public health officials to potential epidemics of abuse and develop responses to engage illicit buprenorphine users in formal treatment programs. Integrated monitoring, using novel information sources like poison control centers, emergency departments, physicians, community pharmacists, and medical examiners, can be used to identify emerging epidemics of buprenorphine “doctor shopping,” diversion, and misuse, allowing public health officials to direct resources toward targeted interventions [63, 96, 128, 129]. Although many existing and developing systems can provide useful information at a state or regional level, more localized surveillance could help to better identify areas with a high prevalence of buprenorphine misuse [98]. In some locations with significant problems regarding the misuse of prescription opioids, such as the United States, existing prescription monitoring programs could incorporate efforts to monitor buprenorphine. In nations where prescription drug diversion is not a major concern, infrastructure many not exist to monitor buprenorphine diversion using PMPs. Additionally, in developing countries and resource-limited settings, PMPs may not be a feasible way to monitor diversion. In any location with a PMP, more active surveillance should also be directed to help physicians engage in safer prescribing practices.

Monitoring of individuals who use buprenorphine, either through directly observed therapy (DOT) or electronic monitoring that records the date and time of medication utilization, could provide another alternative to ensuring compliance with buprenorphine treatment, following a similar model to some antiretroviral adherence studies for HIV-positive individuals in the U.S. In Finland, Tacke and colleagues recently reported on a pilot study examining the feasibility and acceptability of electronic monitoring, using a device that registers the time and date of tablet removal in a study sample of 12 buprenorphine patients. The technology was well accepted and participants reported increased adherence to their treatment plans and decreased diversion of buprenorphine [130]. The costs associated with electronic monitoring devices may be unreasonable in resource limited settings, in locales where patients must pay for their own treatment, or where insurance companies or government agencies are hesitant to burden the extra cost.

Another approach to decrease the street demand for illicit buprenorphine could be to increase availability of buprenorphine and buprenorphine/naloxone. Market economic principles would suggest that, with greater availability, cost could decrease and access to care and utilization of care could increase. This could potentially decrease the demand for illicit buprenorphine.

Novel and Alternative Delivery Systems for Buprenorphine

Novel and alternative delivery systems could represent an innovative way to decrease buprenorphine diversion without compromising access to affordable care. One example is

alternate day dosing with sublingual buprenorphine, which was shown to be clinically effective, feasible, and acceptable to patients over the past two decades [131–133]. In situations where health care professionals directly observe patient dosing with buprenorphine, alternate day dosing has the potential to allow patients to make fewer trips to the dosing location and requires less contact time for health care professionals. Also, in locations where diversion of buprenorphine take-home doses is an issue, alternate day dosing at a medical facility could help to curtail diversion.

Clinical trials with Probuphine[®], which utilizes sustained release technology in a hard-to-extract subdermal implant, have shown steady blood levels of buprenorphine for at least six months and little evidence of withdrawal [134]. Anecdotal evidence from trial participants also indicates a preference for the subdermal product because of its lack of opioid effect and absence of withdrawal symptoms [134]. Larger trials will be required before this product can be utilized on a widespread basis.

Although many people who use buprenorphine therapeutically consume the medication sublingually, it has been noted that IDUs who inject buprenorphine to alleviate withdrawal symptoms may experience the same level of improvement as those who take it sublingually [87]. In their 2008 manuscript, Aitken *et al.* suggest that an injectable form of buprenorphine could be developed and prescribed by physicians for use in a community setting [87]. Further examination of the diversion potential, patient acceptability, clinical efficacy, and physician opinion of an injectable form of buprenorphine would be necessary before such an option could be offered to opioid-dependent IDUs.

Transdermal buprenorphine has also been studied, and could be utilized during acute detoxification. Recent studies have shown that transdermal buprenorphine is safe, well-tolerated, and clinically effective for heroin detoxification, suggesting that a 7-day application of transdermal buprenorphine may be an effective mode of opioid detoxification [135, 136].

The introduction of buprenorphine/naloxone combination product to areas that are currently experiencing buprenorphine monoproduct diversion could reduce levels of diversion, although this approach has not been validated by field experience [55]. The naloxone component of buprenorphine/naloxone, which should precipitate withdrawal if injected by opioid-dependent individuals [22–25], could result in lower levels of abuse and a lower street value than buprenorphine monoproduct. In locations that do not currently allow the use buprenorphine or buprenorphine/naloxone, initial introduction of buprenorphine/naloxone may result in lower levels of abuse than what might be expected with the sole introduction of buprenorphine monoproduct. In such areas, initial negative experiences with the misuse of buprenorphine/naloxone may result in a low desirability and demand for illicit buprenorphine and/or buprenorphine/naloxone.

Additionally, Reckitt-Benckiser, the manufacturer of brand name Suboxone[®] and Subutex[®], recently received approval to market Suboxone[®] film in the United States [137]. New research examining buprenorphine diversion should consider the abuse potential of this form of buprenorphine.

AREAS FOR FURTHER RESEARCH

Research is still needed to understand the motivating factors for the diversion, abuse, and non-medically supervised use of buprenorphine, particularly in a context that is consistent with the medication's therapeutic purpose. Novel, longitudinal research is also needed to understand the long-term implications of illicit buprenorphine use, including but not limited to its effects on HIV-risk behavior and treatment seeking behavior for opioid dependence.

Future clinical investigations could also examine the feasibility and efficacy of intermittently prescribed buprenorphine for individuals who are interested in abstaining from illicit opioid use but who are unwilling or unable to enter formal treatment. More clinical research is needed to understand the efficacy, capabilities, and safety and diversion concerns of novel forms of buprenorphine, including subdermal and transdermal patches and implants and Suboxone film.

Also, more data are needed to understand the involvement of buprenorphine in overdose events (particularly when used concomitantly with other substances), to assess other adverse consequences, and to describe specifics as to why individuals inject buprenorphine, including the role of injection buprenorphine in the drug use profiles of polydrug users. Complications arising from injection buprenorphine use should be further investigated to determine whether complications are unique to buprenorphine, a result of poly-drug use, or are simply complications that can be expected of any injection drug use.

Countries that limit the number of patients per provider, such as the United States, should critically examine these limits and assess their influence on provider availability and clinical efficacy—expanding the number of patients allowed under these limits or removing them entirely may provide enhanced access to buprenorphine treatment.

Additionally, countries currently offering directly observed therapy (DOT) buprenorphine could examine the possibility of a transition to buprenorphine/naloxone, which may allow for expanded access, take-home dosing, and/or a lower level of abuse potential. Finally, future research could also examine the potential impact of over-the-counter sale of buprenorphine or buprenorphine/naloxone, especially in locations where access to prescribers is limited. More quantitative, qualitative, and ethnographic research and data are needed on an international level to understand all of these issues.

CONCLUSIONS

Opioid abuse and dependency exert an important and pressing social, economic, and biomedical toll throughout the world. Opioid substitution therapy has been proven to reduce illicit opioid use, lower rates of arrest and recidivism, decrease rates of disease transmission, and increase treatment compliance for co-occurring morbidities [15, 138–140]. Buprenorphine (Subutex[®] or generic) and buprenorphine/naloxone (Suboxone[®]) are clinically safe and effective for the treatment of opioid dependency [13, 25, 36, 94, 138, 141]. Buprenorphine's safety profile, ceiling effect at high doses, ability to be coformulated with naloxone to limit injection abuse, and lower abuse potential compared to full opioid agonists make it a suitable medication for office-based treatment of opioid dependency.

Wherever there is access to any medication with abuse potential, diversion is likely to follow, making it unsurprising that buprenorphine diversion has been documented. In the face of documented diversion, it is important to remember that buprenorphine is a clinically effective and safe medication for the treatment of opioid dependence, with considerably lower risk potential than other opioids.

Ultimately, introduction of buprenorphine to over 40 countries throughout the world has increased access to an essential medication and helped hundreds of thousands of individuals regain stability in their lives and avert negative health consequences associated with opioid abuse and injection. These benefits—whether achieved through access to a legitimate prescription or through the therapeutic use of diverted buprenorphine on the street—should be considered, such that any attempt to limit the diversion and illicit use of buprenorphine does not result in a concomitant decrease in the accessibility of this potentially life saving medicine. Extensive efforts should be made to ensure adequate accessibility to affordable

buprenorphine programs as an option for all individuals with opioid dependence and to engage individuals who are currently self-treating opioid dependence with diverted buprenorphine in formal treatment programs with proper medical and psychosocial support.

DEFINITIONS

In this document, the term “non-medically supervised use” refers to use that approximates reasonable clinical use (sublingual administration). In contrast, the terms “misuse” and “abuse” refer to the use of buprenorphine, either alone or in combination with other drugs, to attain euphoria or “get high,” and also refer to instances of buprenorphine use in a dangerous manner (for example, by intravenous administration). “Diversion” refers to the act of redirecting buprenorphine or buprenorphine/naloxone from legitimate sources to illegitimate or illegal ones. The term “buprenorphine” refers to the buprenorphine mono-product (Subutex®), whereas “buprenorphine/naloxone” refers to the coformulated product (Suboxone®). Suboxone® is coformulated in a 4:1 ratio of buprenorphine to naloxone, and is available in 2mg/0.5mg and 8mg/2mg doses. Subutex® is generally available in 0.4mg, 2mg, and 8mg doses.

Although buprenorphine diversion, abuse, misuse, and non-medically supervised use have been examined in the current literature, manuscripts on this topic rarely explicitly define these terms.

Acknowledgments

This research was supported by grant P30-AI-42853 from the National Institutes of Health, Center for AIDS Research (NIH/CFAR), P30DA013868 from the Center for Drug Abuse and AIDS Research (NIH/CDAAR), R21CE001846-01 from the Centers for Disease Control and Prevention, National Center for Injury Prevention and Control (CDC/NCIPC), and K24DA022112 from the National Institutes of Health, National Institute on Drug Abuse (NIH/NIDA). The content of this manuscript is solely the responsibility of the authors and does not necessarily represent the official views of NIH, NIDA, CDAAR, CFAR, CDC, or NCIPC. The authors wish to thank the reviewers for their insightful comments and thoughts on this manuscript.

ABBREVIATIONS

DATA 2000	United States Drug Abuse Treatment Act of 2000
DOT	Directly observed therapy
IDU	Injection drug user
OBT	Office-based treatment
PMP	Prescription monitoring program
SAMHSA	United States Substance Abuse and Mental Health Services Administration
SEP	Syringe exchange program
U.S.	United States
UNAIDS	United Nations Joint Program on HIV/AIDS
WHO	World Health Organization

References

1. Degenhardt L, Hall W, Warner-Smith M. Using cohort studies to estimate mortality among injecting drug users that is not attributable to AIDS. *Sex Transm Infect.* 2006; 82(Suppl 3):iii56–63. [PubMed: 16735295]

2. Strassels SA. Economic burden of prescription opioid misuse and abuse. *J Managed Care Pharm.* 2009; 15(7):1–7.
3. United Nations Office on Drugs and Crime. *World Drug Report.* 2007.
4. World Health Organization. *WHO Drug Information.* Vol. 19. 2005. p. 72
5. World Health Organization, Office on Drugs and Crime. *Drug Report.* 2007.
6. World Health Organization; UNAIDS Joint Program on HIV/AIDS. *Consensus Statement of the Reference Group to the United Nations on HIV and Injecting Drug Use WHO.* 2010; 2010:1–152.
7. World Health Organization. *Guidelines for the Psychosocially Assisted Pharmacological Treatment of Opioid Dependence.* WHO; 2009. p. 1-134.
8. Gebo KA, Diener-West M, Moore RD. Hospitalization rates differ by hepatitis C status in an urban HIV cohort. *J Acquir Immune Defic Syndr.* 2003; 34(2):165–73. [PubMed: 14526205]
9. Ho R, Ho E, Mak A. Cutaneous complications among i.v. buprenorphine users. *J Dermatol.* 2009; 36(1):22–9. [PubMed: 19207433]
10. Sande, M.; Volberding, P. *The Medical Management of AIDS.* Philadelphia: WB Saunders; 1999.
11. Volkow ND, Li TK. Drug addiction: the neurobiology of behaviour gone awry. *Nat Rev Neurosci.* 2004; 5(12):963–70. [PubMed: 15550951]
12. Dole V, Nyswander M. A Medical Treatment for Diacetylmorphine (Heroin) Addiction. *JAMA.* 1965; 193(8):80–4.
13. *Physicians' Desk Reference 2009.* 63. Montvale, NJ: Physicians' Desk Reference; 2009.
14. Mattick RP, Breen C, Kimber J, Davoli J. Methadone maintenance therapy versus no opioid replacement therapy for opioid dependence. *Cochrane Database Syst Rev.* 2009; 3:1–17.
15. Mattick RP, Ali R, White J, O'Brien S, Wolk S, Danz C. Buprenorphine versus methadone maintenance therapy: a randomized double-blind trial with 405 opioid-dependent patients. *Addiction.* 2003; 98(4):441–52. [PubMed: 12653814]
16. Mattick RP, Kimber J, Breen C, Davoli M. Buprenorphine maintenance versus placebo or methadone maintenance for opioid dependence. *Cochrane Database Syst Rev.* 2008; 2:1–51.
17. Marsch LA. The efficacy of methadone maintenance interventions in reducing illicit opiate use, HIV risk behavior and criminality: a meta-analysis. *Addiction.* 1998; 93(4):515–32. [PubMed: 9684390]
18. National Institutes of Health. *Interventions to Prevent HIV Risk Behaviors. Consensus Development Conference Statement.* 1997; 15(2):1–41.
19. Gowing LR, Farrell M, Bornemann R, Sullivan L, Ali R. Brief report: Methadone treatment of injecting opioid users for prevention of HIV infection. *J Gen Intern Med.* 2006; 21(2):193–5. [PubMed: 16336624]
20. Walsh SL, Preston K, Stitzer M, Cone E, Bigelow G. Clinical pharmacology of buprenorphine: ceiling effects at high doses. *Clin Pharmacol Ther.* 1994; 55(5):569–80. [PubMed: 8181201]
21. Fiellin DA, Rosenheck RA, Kosten TR. Office-based treatment for opioid dependence: reaching new patient populations. *Am J Psychiatry.* 2001; 158(8):1200–4. [PubMed: 11481150]
22. Elkader A, Sproule B. Buprenorphine: clinical pharmacokinetics in the treatment of opioid dependence. *Clin Pharmacokinet.* 2005; 44(7):661–80. [PubMed: 15966752]
23. Fiellin DA, Friedland GH, Gourevitch MN. Opioid dependence: rationale for and efficacy of existing and new treatments. *Clin Infect Dis.* 2006; 43 (Suppl 4):S173–7. [PubMed: 17109303]
24. Harris DS, Jones RT, Welm S, Upton RA, Lin E, Mendelson J. Buprenorphine and naloxone co-administration in opiate-dependent patients stabilized on sublingual buprenorphine. *Drug Alcohol Depend.* 2000; 61(1):85–94. [PubMed: 11064186]
25. Mendelson J, Jones RT. Clinical and pharmacological evaluation of buprenorphine and naloxone combinations: why the 4:1 ratio for treatment? *Drug Alcohol Depend.* 2003; 70 (2 Suppl):S29–37. [PubMed: 12738348]
26. Rolly G, Verschelen L. Buprenorphine as postoperative analgesic. *Acta Anaesthesiologica Belgica.* 1976; 3:183–6. [PubMed: 801582]
27. Adriaensen H, Van De Walle J. Clinical use of buprenorphine in chronic administration. *Acta Anaesthesiologica Belgica.* 1976; 3:1–5.
28. Harper I. Tamgesic Abuse. *New Zealand Med J.* 1983; 96(741):777. [PubMed: 6578447]

Curr Drug Abuse Rev. Author manuscript; available in PMC 2011 August 11.

29. Strang J. Abuse of buprenorphine. *Lancet*. 1985; 2(8457):725. [PubMed: 2863704]
30. Bourin, M.; Zhiji, C.; DeLima, L. WHO Expert Committee on Drug Dependence: Thirty-third Report. WHO; 2003. p. 1-31.
31. Auriacombe M, Fatseas M, Dubernet J, Daulouede JP, Tignol J. French field experience with buprenorphine. *Am J Addict*. 2004; 13 (Suppl 1):S17–28. [PubMed: 15204673]
32. Mello NK, Mendelson JH. Buprenorphine suppresses heroin use by heroin addicts. *Science*. 1980; 207 (4431):657–9. [PubMed: 7352279]
33. Schuman-Olivier Z, Albanese M, Nelson SE, et al. Self-treatment: illicit buprenorphine use by opioid-dependent treatment seekers. *J Subst Abuse Treat*. 2010; 39(1):41–50. [PubMed: 20434868]
34. United States National Institutes of Health; National Institute on Drug Abuse (NIH/NIDA). Buprenorphine: an alternative treatment for opioid dependence. In: Blaine, J., editor. NIDA Research Monograph Series. 1992.
35. Johnson RE, Jaffe JH, Fudala PJ. A controlled trial of buprenorphine treatment for opioid dependence. *JAMA*. 1992; 267(20):2750–5. [PubMed: 1578593]
36. Gibson AE, Doran CM, Bell JR, Ryan A, Lintzeris N. A comparison of buprenorphine treatment in clinic and primary care settings: a randomised trial. *Med J Aust*. 2003; 179(1):38–42. [PubMed: 12831383]
37. Amass L, Ling W, Freese TE, et al. Bringing buprenorphine-alozone detoxification to community treatment providers: the NIDA Clinical Trials Network field experience. *Am J Addict*. 2004; 13 (Suppl 1):S42–66. [PubMed: 15204675]
38. Fiellin DA, O'Connor PG. Clinical practice: Office-based treatment of opioid-dependent patients. *N Engl J Med*. 2002; 347(11):817–23. [PubMed: 12226153]
39. Bridge TP, Fudala PJ, Hebert S, Leiderman DB. Safety and health policy considerations related to the use of buprenorphine/naloxone as an office-based treatment for opiate dependence. *Drug Alcohol Depend*. 2003; 70 (2 Suppl):S79–85. [PubMed: 12738352]
40. Mendelson J, Jones RT, Fernandez I, Welm S, Melby AK, Baggott MJ. Buprenorphine and naloxone interactions in opiate-dependent volunteers. *Clin Pharmacol Ther*. 1996; 60(1):105–14. [PubMed: 8689806]
41. Walsh SL, Eissenberg T. The clinical pharmacology of buprenorphine: extrapolating from the laboratory to the clinic. *Drug Alcohol Depend*. 2003; 70 (2 Suppl):S13–27. [PubMed: 12738347]
42. Duke AN, Correia CJ, Walsh SL, Bigelow GE, Strain EC. Acute effects of intramuscular and sublingual buprenorphine and buprenorphine/naloxone in non-dependent opioid abusers. *Psychopharmacology (Berl)*. 2010; 211(3):303–12. [PubMed: 20577717]
43. Karlsson M, Berggren AC. Efficacy and safety of low-dose transdermal buprenorphine patches (5, 10, and 20 microg/h) versus prolonged-release tramadol tablets (75, 100, 150, and 200 mg) in patients with chronic osteoarthritis pain: a 12-week, randomized, open-label, controlled, parallel-group noninferiority study. *Clin Ther*. 2009; 31(3):503–13. [PubMed: 19393841]
44. Gordon A, Callaghan D, Spink D, et al. Buprenorphine transdermal system in adults with chronic low back pain: a randomized, double-blind, placebo-controlled crossover study, followed by an open-label extension phase. *Clin Ther*. 2010; 32(5):844–60. [PubMed: 20685494]
45. Malinoff HL, Barkin RL, Wilson G. Sublingual buprenorphine is effective in the treatment of chronic pain syndrome. *Am J Ther*. 2005; 12(5):379–84. [PubMed: 16148422]
46. James IGV, O'Brien CM, McDonald CJ. A randomized, double-blind, double-dummy comparison of the efficacy and tolerability of low-dose transdermal buprenorphine (BuTrans seven-day patches) with buprenorphine sublingual tablets (Temgesic) in patients with osteoarthritis pain. *J Pain Symptom Manage*. 2010; 40(2):266–78. [PubMed: 20541900]
47. Kress HG. Clinical update on the pharmacology, efficacy and safety of transdermal buprenorphine. *Eur J Pain*. 2009; 13(3):219–30. [PubMed: 18567516]
48. Buprenorphine [webpage on the Internet]. United States Substance Abuse and Mental Health Services Administration (SAMHSA): Center for Substance Abuse Treatment (CSAT); [update 2010; cited 2010 October]; Available from: <http://buprenorphine.samsha.gov>
49. Carrieri MP, Amass L, Lucas GM, Vlahov D, Wodak A, Woody GE. Buprenorphine use: the international experience. *Clin Infect Dis*. 2006; 43 (Suppl 4):S197–215. [PubMed: 17109307]

Curr Drug Abuse Rev. Author manuscript; available in PMC 2011 August 11.

50. Winstock AR, Lea T. Diversion and Injection of Methadone and Buprenorphine Among Clients in Public Opioid Treatment Clinics in New South Wales, Australia. *Subst Use Misuse*. 2010; 45(1–2):240–52. [PubMed: 20025451]
51. New South Wales Department of Health. Opioid Treatment Program: Clinical Guidelines for methadone and buprenorphine treatment. Sydney, Australia: 2006. p. 183
52. Lintzeris N. Australian National Clinical Guidelines and Procedures for the use of buprenorphine in the maintenance treatment of opioid dependence. Australian Government: National Drug Strategy. 2006:1–82.
53. Basu D, Mattoo SK, Malhorta A, Gupta N, Malhorta R. A longitudinal study of male buprenorphine addicts attending an addiction clinic in India. *Addiction*. 2000; 95(9):1363–72. [PubMed: 11048355]
54. Kumar MS, Natale R, Langkham B, Sharma C, Kabi R, Mortimore G. Opioid substitution treatment with sublingual buprenorphine in Manipur and Nagaland in Northeast India: what has been established needs to be continued and expanded. *Harm Reduct J*. 2009; 6:4. [PubMed: 19243636]
55. Bruce RD, Govindasamy S, Sylla L, Kamarulzaman A, Altice FL. Lack of reduction in buprenorphine injection after introduction of co-formulated buprenorphine/naloxone to the Malaysian market. *Am J Drug Alcohol Abuse*. 2009; 35(2):68–72. [PubMed: 19212931]
56. Jasinski DR, Pevnick JS, Griffith JD. Human pharmacology and abuse potential of the analgesic buprenorphine: a potential agent for treating narcotic addiction. *Arch Gen Psychiatry*. 1978; 35(4):501–16. [PubMed: 215096]
57. Pickworth WB, Johnson RE, Holicky BA, Cone EJ. Subjective and physiologic effects of intravenous buprenorphine in humans. *Clin Pharmacol Ther*. 1993; 53(5):570–6. [PubMed: 8491067]
58. Comer SD, Collins ED. Self-administration of intravenous buprenorphine and the buprenorphine/naloxone combination by recently detoxified heroin abusers. *J Pharmacol Exp Ther*. 2002; 303(2):695–703. [PubMed: 12388653]
59. Comer SD, Collins ED, Fischman MW. Intravenous buprenorphine self-administration by detoxified heroin abusers. *J Pharmacol Exp Ther*. 2002; 301(1):266–76. [PubMed: 11907183]
60. Comer SD, Sullivan MA, Walker EA. Comparison of intravenous buprenorphine and methadone self-administration by recently detoxified heroin-dependent individuals. *J Pharmacol Exp Ther*. 2005; 315(3):1320–30. [PubMed: 16144974]
61. Bedi N, Ray R, Jain R, Dhar N. Abuse Liability of buprenorphine--a study among experienced drug users. *Indian J Physiol Pharmacol*. 1998; 42(1):95–100. [PubMed: 9513799]
62. Sigmon SC, Moody DE, Nuwsayer ES, Bigelow GE. An injection depot formulation of buprenorphine: extended bio-delivery and effects. *Addiction*. 2006; 101(3):420–32. [PubMed: 16499515]
63. Baumevieille M, Haramburu F, Bégaud B. Abuse of prescription medicines in southwestern France. *Ann Pharmacother*. 1997; 31(7–8):847–50. [PubMed: 9220042]
64. Vicknasingam B, Mazlan M, Schottenfeld R, Chawarski M. Injection of buprenorphine and buprenorphine/naloxone tablets in Malaysia. *Drug Alcohol Depend*. 2010; 6 [In Press].
65. Strain EC, Walsh SL, Preston KL, Liebson IA, Bigelow GE. The effects of buprenorphine in buprenorphine-maintained volunteers. *Psychopharmacology (Berl)*. 1997; 129(4):329–38. [PubMed: 9085402]
66. Wesson DR, Smith DE. Buprenorphine in the treatment of opiate dependence. *J Psychoactive Drugs*. 2010; 42(2):161–75. [PubMed: 20648912]
67. Collins GB, McAllister MS. Buprenorphine maintenance: a new treatment for opioid dependence. *Cleve Clin J Med*. 2007; 74(7):514–20. [PubMed: 17682629]
68. Bickel WK, Stitzer ML, Bigelow GE, Liebson IA, Jasinski DR, Johnson RE. Buprenorphine: dose-related blockade of opioid challenge effects in opioid dependent humans. *J Pharmacol Exp Ther*. 1988; 247(1):47–53. [PubMed: 2459370]
69. Comer SD, Sullivan M, Whittington RA, Vosberg S, Kowalczyk WJ. Abuse liability of prescription opioids compared to heroin in morphine-maintained heroin abusers. *Neuropsychopharmacology*. 2008; 33(5):1179–91. [PubMed: 17581533]

70. Moatti JP, Vlahov D, Feroni I, Perrin V, Odabia Y. Multiple access to sterile syringes for injection drug users: vending machines, needle exchange programs and legal pharmacy sales in Marseille, France. *Eur Addict Res.* 2001; 7(1):40–5. [PubMed: 11316925]
71. Bouchez J, Vignau J. The French experience--the pharmacist, general practitioner and patient perspective. *Eur Addict Res.* 1998; 4 (Suppl 1):19–23. [PubMed: 9767202]
72. Boeuf O, Lapeyre-Mestre M. French Network of Centers for Evaluation and Information Pharmacodependence (CEIP). Survey of forged prescriptions to investigate risk of psychoactive medications abuse in France: results of OSIAP survey. *Drug Saf.* 2007; 30(3):265–76. [PubMed: 17343432]
73. Lapeyre-Mestre M, Damase-Michel C, Adams P, Michaud P, Montastruc JL. Falsified or forged medical prescriptions as an indicator of pharmacodependence: a pilot study. Community pharmacists of the Midi-Pyrénées. *Eur J Clin Pharmacol.* 1997; 52(1):37–9. [PubMed: 9143865]
74. Obadia Y, Perrin V, Feroni I, Vlahov D, Moatti JP. Injecting misuse of buprenorphine among French drug users. *Addiction.* 2001; 96(2):267–72. [PubMed: 11182872]
75. Roux P, Villes V, Bry D, et al. Buprenorphine sniffing as a response to inadequate care in substituted patients: results from the Subazur survey in south-eastern France. *Addictive Behaviors.* 2008; 33(12):1625–9. [PubMed: 18775604]
76. Strang J. Abuse of buprenorphine (Temgesic) by snorting. *BMJ.* 1991; 302(6782):969. [PubMed: 2032057]
77. Aalto M, Halme J, Visapaa J, Salaspuro M. Buprenorphine Misuse in Finland. *Subst Use Misuse.* 2007; 42(6):1027–8. [PubMed: 17613961]
78. Finland (Overview) [webpage on the Internet]. European Monitoring Centre for Drugs and Drug Addiction; [updated 2010; cited 2010 October]; Available from: <http://www.emcdda.europa.eu>
79. Alho H, Sinclair D, Vuori E, Holopainen A. Abuse liability of buprenorphine-naloxone tablets in untreated IV drug users. *Drug Alcohol Depend.* 2007; 88(1):75–8. [PubMed: 17055191]
80. Hakansson A, Medvedeo A, Andersson M, Berglund M. Buprenorphine misuse among heroin and amphetamine users in Malmo, Sweden: purpose of misuse and route of administration. *Eur Addict Res.* 2007; 13(4):207–15. [PubMed: 17851242]
81. Lavelle TL, Hammersley R, Forsyth A. The use of buprenorphine and temazepam by drug injectors. *J Addict Dis.* 1991; 10(3):5–14. [PubMed: 1932153]
82. Sakol MS, Stark C, Sykes R. Buprenorphine and temazepam abuse by drug takers in Glasgow--an increase. *Br J Addict.* 1989; 84(4):439–41. [PubMed: 2566343]
83. Mounteney J, Haugland S. Earlier warning: a multi-indicator approach to monitoring trends in the illicit use of medicines. *Int J Drug Policy.* 2009; 20(2):161–9. [PubMed: 18032012]
84. O'Connor JJ, Moloney E, Travers R, Campbell A. Buprenorphine abuse among opiate addicts. *Br J Addict.* 1988; 83(9):1085–7. [PubMed: 3265643]
85. San L, Torrens M, Castillo C, Porta M, de la Torre R. Consumption of buprenorphine and other drugs among heroin addicts under ambulatory treatment: results from cross-sectional studies in 1988 and 1990. *Addiction.* 1993; 88(10):1341–9. [PubMed: 8251871]
86. Horyniak D, Dietze P, Larance B, Winstock A, Degenhardt L. The prevalence and correlates of buprenorphine inhalation amongst opioid substitution treatment (OST) clients in Australia. *Int J Drug Policy.* 2010; 5 [Article in Press].
87. Aitken CK, Higgs PG, Hellard ME. Buprenorphine injection in Melbourne, Australia--an update. *Drug Alcohol Rev.* 2008; 27(2):197–9. [PubMed: 18264882]
88. Jenkinson R, Clark NC, Fry CL, Dobbin M. Buprenorphine diversion and injection in Melbourne, Australia: an emerging issue? *Addiction.* 2005; 100(2):197–205. [PubMed: 15679749]
89. Winstock AR, Lea T, Jackson AP. Methods and motivations for buprenorphine diversion from public opioid substitution treatment clinics. *J Addict Dis.* 2009; 28(1):57–63. [PubMed: 19197596]
90. Winstock AR, Lea T, Sheridan J. What Is Diversion of Supervised Buprenorphine and How Common Is It? *J Addict Dis.* 2009; 28(3):1–11. [PubMed: 19197589]
91. DEA: Drugs of concern: Buprenorphine [homepage on the Internet]. United States Department of Justice, Drug Enforcement Agency (DEA); [cited 2011 January]. Available from: http://www.deadiversion.usdoj.gov/drugs_concern/buprenorphine.htm

92. Fudala PJ, Bridge TP, Hebert S, et al. Office-based treatment of opiate addiction with a sublingual-tablet formulation of buprenorphine and naloxone. *N Engl J Med.* 2003; 349(10):949–58. [PubMed: 12954743]
93. Reckitt Benckiser Pharmaceuticals Inc. Suboxone and Subutex: US Prescribing Information. 2006.
94. United States Substance Abuse and Mental Health Services Administration. Treatment Improvement Protocol 40 (TIP 40): Clinical Guidelines for the Use of Buprenorphine in the Treatment of Opioid Addiction. 2004. p. 169
95. Cicero TJ, Inciardi JA, Muñoz A. Trends in abuse of Oxycontin and other opioid analgesics in the United States: 2002–2004. *J Pain.* 2005; 6(10):662–72. [PubMed: 16202959]
96. Hughes AA, Bogdan GM, Dart RC. Active surveillance of abused and misused prescription opioids using poison center data: A pilot study and descriptive comparison. *Clin Toxicol.* 2007; 45(2):144–51.
97. Rosenblum A, Parrino M, Schnoll SH, et al. Prescription opioid abuse among enrollees into methadone maintenance treatment. *Drug Alcohol Depend.* 2007; 90(1):64–71. [PubMed: 17386981]
98. Schneider MF, Bailey JE, Cicero TJ, et al. Integrating nine prescription opioid analgesics and/or four signal detection systems to summarize statewide prescription drug abuse in the United States in 2007. *Pharmacoepidemiol Drug Saf.* 2009; 18(9):778–90. [PubMed: 19536784]
99. Smith MY, Bailey JE, Woody GE, Kleber HD. Abuse of buprenorphine in the United States: 2003–2005. *J Addict Dis.* 2007; 26(3):107–11. [PubMed: 18018814]
100. Monte A, Mandell T, Wilford B, Tennyson J, Boyer E. Diversion of Buprenorphine/Naloxone Coformulated Tablets in a Region with High Prescribing Prevalence. *J Addict Dis.* 2009; 28(3): 226–31. [PubMed: 20155591]
101. Bazazi AR, Yokell M, Fu J, Zaller ND, Rich JD. Illicit use of buprenorphine/naloxone among injecting and non-injecting opioid users. *J Add Med.* 2011 [In Press].
102. Mazlan M, Schottenfeld RS, Chawarski MC. New challenges and opportunities in managing substance abuse in Malaysia. *Drug Alcohol Rev.* 2006; 25(5):473–8. [PubMed: 16939945]
103. Panda S, Kumar MS, Lokabiraman S, et al. Risk factors for HIV infection in injection drug users and evidence for onward transmission of HIV to their sexual partners in Chennai, India. *J Acquir Immune Defic Syndr.* 2005; 39(1):9–15. [PubMed: 15851908]
104. Solomon SS, Desai M, Srikrishnan A, et al. The Profile of Injection Drug Users in Chennai, India: Identification of Risk Behaviours and Implications for Interventions. *Subst Use Misuse.* 2010; 45(3):354–67. [PubMed: 20141452]
105. Chatterjee A, Uprety L, Chapagain M, Kafle K. Drug abuse in Nepal: a rapid assessment study. *Bull Narc.* 1996; 48(1–2):11–33. [PubMed: 9839033]
106. Panda S, Chatterjee A, Sarkar S, et al. Injection drug use in Calcutta: a potential focus for an explosive HIV epidemic. *Drug Alcohol Rev.* 1997; 16(1):17–23. [PubMed: 16203407]
107. Chong E, Poh KK, Shen L, Yeh IB, Chai P. Infective endocarditis secondary to intravenous Subutex abuse. *Singapore Med J.* 2009; 50(1):34–42. [PubMed: 19224082]
108. Bruce RD, Govidasamy S, Sylla L, Haddad M, Kamarulzaman A, Altice FL. Case Series of Buprenorphine Injectors in Kuala Lumpur, Malaysia. *Am J Drug Alcohol Abuse.* 2008; 34(4): 511–7. [PubMed: 18584580]
109. Cone EJ, Gorodetzky CW, Yousefnejad D, Buchwald WF, Johnson RE. The metabolism and excretion of buprenorphine in humans. *Drug Metab Dispos.* 1984; 12(5):577–81. [PubMed: 6149907]
110. Mendelson J, Upton RA, Everhart ET, Jacob P, Jones RT. Bioavailability of sublingual buprenorphine. *J Clin Pharmacol.* 1997; 37(1):31–7. [PubMed: 9048270]
111. JBS International Maxwell JC. Report Submitted to SAMHSA. 2006. Diversion and Abuse of Buprenorphine: A Brief Assessment of Emerging Indicators; p. 70
112. Chowdhury AN, Chowdhury S. Buprenorphine abuse: report from India. *Br J Addict.* 1990; 85(10):1349–50. [PubMed: 2265296]
113. Vidal-Trecañ G, Varescon I, Nabet N, Boissonnas A. Intravenous use of prescribed sublingual buprenorphine tablets by drug users receiving maintenance therapy in France. *Drug Alcohol Depend.* 2003; 69(2):175–81. [PubMed: 12609698]

Curr Drug Abuse Rev. Author manuscript; available in PMC 2011 August 11.

114. Kumar M, Mudaliar S, Thyagarajan S, Kumar S, Selvanayagam A, Daniels D. Rapid assessment and response to injecting drug use in Madras, south India. *Int J Drug Policy*. 2000; 11(1–2):83–98. [PubMed: 10699546]
115. Sullivan LE, Moore BA, Chawarski MC, et al. Buprenorphine/naloxone treatment in primary care is associated with decreased human immunodeficiency virus risk behaviors. *J Subst Abuse Treat*. 2008; 35(1):87–92. [PubMed: 17933486]
116. Otiashvili D, Zabransky T, Kirtadze I, Piralishvili G, Chavchanidze M, Miovsky M. Why do the clients of Georgian needle exchange programmes inject buprenorphine? *Eur Addict Res*. 2010; 16(1):1–8. [PubMed: 19887803]
117. Ho R, Ho E, Tan C, Mak A. Pulmonary Hypertension in First Episode Infective Endocarditis among Intravenous Buprenorphine Users: Case Report. *Am J Drug Alcohol Abuse*. 2009; 35(3):199–202. [PubMed: 19462305]
118. Partanen TA, Vikatmaa P, Tukiainen E, Lepantelo M, Vuola J. Outcome after Injections of Crushed Tablets in Intravenous Drug Abusers in the Helsinki University Central Hospital. *Eur J Vascular Endovasc Surg*. 2010; 37(6):704–11.
119. Green, TC.; Bowman, S. Association between initiation of nonmedical use of prescription opioids and initiation of injection and heroin use in a national sample of drug users. *Proceedings of the Harm Reduction Coalition Conference*; 2010; Austin, TX, USA.
120. Johnson RE, Strain EC, Amass L. Buprenorphine: how to use it right. *Drug Alcohol Depend*. 2003; 70(2 Suppl):S59–77. [PubMed: 12738351]
121. Orman JS, Keating GM. Spotlight on buprenorphine/naloxone in the treatment of opioid dependence. *CNS Drugs*. 2009; 23(10):899–902. [PubMed: 19739698]
122. Robinson SE. Buprenorphine: an analgesic with an expanding role in the treatment of opioid addiction. *CNS Drug Rev*. 2002; 8(4):377–90. [PubMed: 12481193]
123. Kintz P. Deaths involving buprenorphine: a compendium of French cases. *Forensic Sci Int*. 2001; 121(1–2):65–9. [PubMed: 11516889]
124. Bell JR, Butler B, Lawrence A, Batey R, Salmelainen P. Comparing overdose mortality associated with methadone and buprenorphine treatment. *Drug Alcohol Depend*. 2009; 104(1–2):73–7. [PubMed: 19443138]
125. Auriacombe M, Franques P, Tignol J. Deaths attributable to methadone vs buprenorphine in France. *JAMA*. 2001; 285(1):45. [PubMed: 11150107]
126. Magura S, Lee JD, Hershberger J, et al. Buprenorphine and methadone maintenance in jail and post-release: a randomized clinical trial. *Drug Alcohol Depend*. 2009; 99(1–3):222–30. [PubMed: 18930603]
127. Pinto H, Maskrey V, Swift L, Rumball D, Wagle A, Holland R. The SUMMIT trial: a field comparison of buprenorphine versus methadone maintenance treatment. *J Subst Abuse Treat*. 2010; 39(4):340–52. [PubMed: 20817384]
128. Pradel V, Frauger E, Thirion X, et al. Impact of a prescription monitoring program on doctor-shopping for high dosage buprenorphine. *Pharmacoepidemiol Drug Saf*. 2009; 18(1):36–43. [PubMed: 19040199]
129. Spiller H, Lorenz DJ, Bailey EJ, Dart R. Epidemiological trends in abuse and misuse of prescription opioids. *J Addict Dis*. 2009; 28(2):130–6. [PubMed: 19340675]
130. Tacke U, Uosukainen H, Kananen M, Kontra K, Pentikänen H. A pilot study about the feasibility and cost-effectiveness of electronic compliance monitoring in substitution treatment with buprenorphine-naloxone combination. *J Opioid Manag*. 2009; 5(6):321–9. [PubMed: 20073406]
131. Johnson RE, Eissenberg T, Stitzer ML, Strain EC, Liebson IA, Bigelow GE. Buprenorphine treatment of opioid dependence: clinical trial of daily versus alternate-day dosing. *Drug Alcohol Depend*. 1995; 40(1):27–35. [PubMed: 8746921]
132. Amass L, Bickel WK, Crean JP, Blake J, Higgins ST. Alternate-day buprenorphine dosing is preferred to daily dosing by opioid-dependent humans. *Psychopharmacology*. 1998; 136(3):217–25. [PubMed: 9566806]
133. Amass L, Kamien JB, Mikulich SK. Efficacy of daily and alternate-day dosing regimens with the combination buprenorphine-naloxone tablet. *Drug Alcohol Depend*. 2000; 58(1–2):143–52. [PubMed: 10669065]

134. White J, Bell J, Saunders J, et al. Open-label dose-finding trial of buprenorphine implants (Probuphine) for treatment of heroin dependence. *Drug Alcohol Depend.* 2009; 103(1–2):37–43. [PubMed: 19403243]
135. Lanier RK, Umbricht A, Harrison JA, Nuwayser ES, Bigelow GE. Evaluation of a transdermal buprenorphine formulation in opioid detoxification. *Addiction.* 2007; 102(10):1648–56. [PubMed: 17854341]
136. Lanier RK, Umbricht A, Harrison JA, Nuwayser ES, Bigelow GE. Opioid detoxification *via* single 7-day application of a buprenorphine transdermal patch: an open-label evaluation. *Psychopharmacology.* 2008; 198(2):149–158. [PubMed: 18327673]
137. Reckitt Benckiser Pharmaceuticals Inc. SUBOXONE Sublingual Film [package insert]. Richmond, VA, USA: 2010.
138. Mattick RP, Kimber J, Breen C, Davoli M. Buprenorphine maintenance versus placebo or methadone maintenance for opioid dependence. *Cochrane Database Syst Rev.* 2008:51.
139. Simpson DD, Joe GW, Rowan-Szal GA. Drug abuse treatment retention and process effects on follow-up outcomes. *Drug Alcohol Depend.* 1997; 47(3):227–35. [PubMed: 9306048]
140. Springer SA, Chen S, Altice FL. Improved HIV and substance abuse treatment outcomes for released HIV-infected prisoners: the impact of buprenorphine treatment. *J Urban Health.* 2010; 87(4):592–602. [PubMed: 20177974]
141. Fatseas M, Auriacombe M. Why buprenorphine is so successful in treating opiate addiction in France. *Curr Psychiatry Rep.* 2007; 9(5):358–64. [PubMed: 17915074]

Key Learning Objectives

Buprenorphine and buprenorphine/naloxone are clinically effective medications for analgesic use and the treatment of opioid dependence. Diversion of buprenorphine and buprenorphine is occurring throughout the world. The reasons for the diversion of these medications are not entirely understood, but include utilization for euphoric effects and self-treatment of opioid dependence. Ultimately, buprenorphine and buprenorphine/naloxone are exciting, relatively new medications for the treatment of opioid dependence, and efforts to control diversion should be considered in concert with efforts to increase access to buprenorphine treatment for individuals with opioid dependence.

Future Research Questions

Further research is needed to gain a better understanding of the motivations for and effects of buprenorphine and buprenorphine/naloxone diversion, misuse, and non-medically supervised use. The medical risks and benefits of illicit buprenorphine use remain unclear. The implications of buprenorphine's concomitant use with other drugs (licit or illicit) and the subsequent risk of overdose should be examined in further detail. Finally, new research is needed to examine the efficacy of existing diversion control measures and to understand the potential impact of new formulations of buprenorphine on diversion.

Table 1

Selected Studies Examining Buprenorphine Diversion from Various Geographic Locations

Author (Reference Number)	Year of Publication	Location	Study Type	Population	Buprenorphine (B) or Buprenorphine/Naloxone (B/N)	Key Findings and Conclusions
Aitken [87]	2008	Australia	Cross-sectional data from a prospective longitudinal cohort	316 active injection drug users	B	32% of IDUs reported injected buprenorphine within the last 3 months and 10% reported buprenorphine as their primary drug of injection. Current enrollment in buprenorphine therapy was significantly associated with buprenorphine injection. Authors report that some buprenorphine injectors may have similar benefits in wellbeing in comparison to those who only use buprenorphine orally
Alho [79]	2007	Finland	Cross-sectional survey	176 attendees at a needle exchange program	B and B/N	73% of respondents reported buprenorphine as their most commonly used injection drug. 68% of respondents had tried buprenorphine/naloxone <i>via</i> IV administration, but the majority (80%) reported having a bad experience. 11% reported using IV buprenorphine for "euphoria or pleasure," while 73% reported doing so "to treat my addiction"
Auriacombe [31]	2004	France	Literature review	N/A	B	About 65,000 patients are treated with buprenorphine each year. IV buprenorphine may occur in up to 20% of those treated with the medication. Opioid overdose rates have declined 79% since buprenorphine's introduction in 1995
Bazazi [101]	2011	USA	Cross-sectional survey	51 injecting and 49 non-injecting out-of-treatment opioid users	B/N	A majority (76%) reported ever obtaining buprenorphine/naloxone illicitly, with a majority using the illicit medication for therapeutic purposes. More IDUs than non-IDUs reported using illicit buprenorphine/naloxone for these purposes, while more non-IDUs than IDUs reported using buprenorphine to "get high."
Bruce [55]	2009	Malaysia	cross-sectional survey	41 buprenorphine/naloxone injectors who previously only injected buprenorphine	B and B/N	The authors assessed the introduction of buprenorphine/naloxone in a country where buprenorphine alone was previously available. The mean injection dose rose during the introduction, and participants reported the development of opioid withdrawal symptoms, which was associated with increased benzodiazepine injection and syringe sharing.
Hakansson [80]	2007	Sweden	Cross-sectional survey	350 attendees at a needle exchange program	B	89% of heroin users reported past-year buprenorphine use, of which 87% reported buprenorphine use for therapeutic purposes

Author (Reference Number)	Year of Publication	Location	Study Type	Population	Buprenorphine (B) or Buprenorphine/Naloxone (B/N)	Key Findings and Conclusions
						(detoxification or treatment of withdrawal) and 11% reported misusing buprenorphine for euphoria. Overall, 43% of illicit users reported consuming buprenorphine intravenously and 29% by snorting.
Kumar [114]	2000	India	cross-sectional rapid assessment	100 IDUs	B	Buprenorphine injectors were less likely to share injection equipment, to have more drug using network members, and to face threats of arrest. 42% of participants reported buprenorphine as their primary drug. 74% of buprenorphine users also reported misuse of other drugs, including benzodiazepine. Buprenorphine users did not exhibit a sense of desperation in obtaining more buprenorphine, as they did not report "agonizing" withdrawal symptoms
Schuman-Olivier [33]	2010	USA	cross-sectional analysis with a subsequent 90-day prospective longitudinal cohort	cross-sectional: 78 patients who were beginning or continuing buprenorphine treatment. prospective longitudinal cohort: 42 of the cross-sectional participants	B/N	Among those seeking treatment, 49% of participants reported using buprenorphine in the last 90 days. Of illicit buprenorphine users, 97% reported using the medication for prevent cravings, 90% reported doing so to prevent withdrawal, and 29% reporting doing so to save money. Illicit use of buprenorphine decreased when participants had access to a legitimate prescription.
Winstock [50]	2010	Australia	cross-sectional survey	448 clients who were receiving treatment at a public opioid clinic	B	27% of participants who received buprenorphine reported ever injecting it, while 66% of methadone users reported injecting methadone. 65.2% participants receiving buprenorphine preferred to take their medication as directed. 51% of participants reported that it was easier to obtain methadone on the street, in comparison to buprenorphine. The median street cost of buprenorphine was \$2.50/mg. The authors suggest that new attempts to limit diversion must consider the impact on personnel, time resources, and patient acceptability

Yokell et al.

Exhibit F: PATAT PAC Attachment 3

Page 26

Curr Drug Abuse Rev. Author manuscript; available in PMC 2011 August 11.

Exposure to opioid maintenance treatment reduces long-term mortality

Amy Gibson¹, Louisa Degenhardt¹, Richard P. Mattick¹, Robert Ali², Jason White³ & Susannah O'Brien¹

National Drug and Alcohol Research Centre, UNSW, Australia,¹ Drug and Alcohol Services South Australia, Australia² and Clinical and Experimental Pharmacology, University of Adelaide, Australia³

ABSTRACT

Aims To (i) examine the predictors of mortality in a randomized study of methadone versus buprenorphine maintenance treatment; (ii) compare the survival experience of the randomized subject groups; and (iii) describe the causes of death. **Design** Ten-year longitudinal follow-up of mortality among participants in a randomized trial of methadone versus buprenorphine maintenance treatment. **Setting** Recruitment through three clinics for a randomized trial of buprenorphine versus methadone maintenance. **Participants** A total of 405 heroin-dependent (DSM-IV) participants aged 18 years and above who consented to participate in original study. **Measurements** Baseline data from original randomized study; dates and causes of death through data linkage with Births, Deaths and Marriages registries; and longitudinal treatment exposure via State health departments. Predictors of mortality examined through survival analysis. **Findings** There was an overall mortality rate of 8.84 deaths per 1000 person-years of follow-up and causes of death were comparable with the literature. Increased exposure to episodes of opioid treatment longer than 7 days reduced the risk of mortality; there was no differential mortality among methadone versus buprenorphine participants. More dependent, heavier users of heroin at baseline had a lower risk of death, and also higher exposure to opioid treatment. Older participants randomized to buprenorphine treatment had significantly improved survival. Aboriginal or Torres Strait Islander participants had a higher risk of death. **Conclusions** Increased exposure to opioid maintenance treatment reduces the risk of death in opioid-dependent people. There was no differential reduction between buprenorphine and methadone. Previous studies suggesting differential effects may have been affected by biases in patient selection.

Keywords Buprenorphine, longitudinal, maintenance treatment, methadone, mortality, opioid dependence, RCT.

Correspondence to: Amy Gibson, NDARC, UNSW, Sydney, NSW 2052, Australia. E-mail: amy.gibson@med.unsw.edu.au
Submitted 31 May 2007; initial review completed 16 August 2007; final version accepted 29 October 2007

INTRODUCTION

Opioid dependence is associated with mortality rates approximately 13 times higher than the general population of the same age and sex [1,2]. Research to date has demonstrated that one of the more effective ways of reducing this increased mortality risk is the provision of opioid replacement therapy which, to date, has been examined for methadone: in one Swedish study, untreated heroin-dependent people had mortality rates 63 times the general population, while the mortality rate was eight times lower in those receiving methadone compared to untreated heroin-dependent people [3]. An Australian study showed that the relative risk of an untreated

heroin-dependent person dying was 3.5 times that of a patient receiving methadone maintenance treatment [4].

The diverse predictors of mortality in opioid-dependent subjects have been considered in a number of cohort studies. A London cohort of heroin-dependent participants recruited in 1969 noted that neither the length of heroin use nor the age at study intake predicted survival; however, external factors such as drug market and treatment system changes were associated with mortality rate changes [5]. A Glasgow cohort recruiting 69% of its participants with heroin as the principal drug of choice (11% in methadone treatment) noted that treatment did not have a significant impact on survival; however, the risk of fatality increased through the drug

user's career, with younger cohort and human immunodeficiency virus (HIV)-positive cohort members having a more rapidly increasing risk of fatality [6]. A cohort study from Thailand noted that the predictors of mortality in injecting opioid or amphetamine drug users recruited from detoxification treatment included ethnic minority status, incident HIV infection and a longer duration of drug injection [7]. Bisexual sexual orientation, homelessness, infrequent injections of heroin/cocaine 'speedballs' and daily use of powdered cocaine or inhalant drugs such as amyl nitrate were all identified as predictors of death in a large group of primarily heroin-using injecting drug users in Washington [8]. These studies have recruited primarily heroin-dependent or injecting drug users from treatment programmes, including methadone maintenance treatment. To our knowledge, none have been noted to recruit from buprenorphine maintenance treatment programmes.

Different maintenance pharmacotherapies may have differential overdose mortality risks: buprenorphine is a partial opioid agonist, whereas methadone is a full opioid agonist [9]. However, there are few published data on mortality associated with buprenorphine treatment compared to methadone, and that which exists is limited to naturalistic studies where patients have self-selected to receive buprenorphine or methadone treatments [10–12], which involves a possible bias in mortality risks between groups. Randomization would remove this selection bias, but no long-term mortality data from randomized studies of methadone versus buprenorphine have yet been published.

Commencing in 1996, a randomized study comparing methadone with buprenorphine maintenance for the treatment of opioid dependence was conducted in Australia [13]. This current study examines the mortality of these 405 randomized study participants 10 years after the commencement of the original study. The study aims to: (i) examine the predictors of mortality in study participants; (ii) compare the survival experience of buprenorphine and methadone-randomized participants, controlled for treatment exposure over time; and (iii) describe the causes of death in the study participants.

METHODS

Participants

Participants consisted of the 405 entrants to a randomized, double-blind trial of buprenorphine versus methadone maintenance therapy for the treatment of opioid dependence, which has been published previously [13]. The participants were recruited originally between 1996 and 1998 from three opioid maintenance treatment clinics in Australia, two in Sydney, NSW and one in

Adelaide, South Australia. All were diagnosed as opioid-dependent according to DSM-IV criteria [14], were aged 18 years or older, lived with commuting distance of the clinic and were willing and able to sign informed consent to participate [13]. In the trial, participants were randomized to receive either methadone or buprenorphine for a 3-month (91-day) study period. Participants could then continue to remain on their randomized treatment for an unrestricted time after the study period.

Baseline measures

Self-reported measures used from the original study data included: sex; Aboriginal or Torres Strait Islander origin; highest level of education; employment status; marital status; number of methadone treatment episodes prior to study; and heroin use prior to study (approximate months of heroin use). Sections of the Opiate Treatment Index [15] were used for level of risky injecting practices (including questions on injecting frequency, using a needle used previously by someone else, lending a used needle to others and cleaning used needles for re-use); level of injection-related problems (including questions on drug overdose, tissue damage resulting from injection and difficulty injecting in last month); level of heroin use ('hits'/smokes/snorts of heroin per day in last month); and level of polydrug use (number of different drug types used in past month). Dependence severity was measured using the Severity of Dependence Scale [16].

Additional variables completed by study personnel included: completion of study treatment (whether a subject remained in study treatment for the full 91 days or not) and randomized group (either methadone or buprenorphine).

Data included in the study

Mortality data

In 2006, data requests were placed for each of the trial participants to obtain both mortality information and opioid maintenance treatment exposure for the 8–10 years after entry into the original study. To obtain mortality information, full identifying data on the study participants was forwarded to the NSW and SA Births, Deaths and Marriages registries. Identifying data included full name, middle initial/middle name if available, any alias names or alternative spelling (not available for SA participants), date of birth, gender and a date of last known contact (date of randomization to the original study). Searches for matches on the basis of these identified data were conducted by Births, Deaths and Marriages staff. Paper reference copies of NSW death certificates were forwarded to the National Drug and Alcohol Research Centre (NDARC) on 2 February 2006, and

electronic copies of SA death certificates followed some months later. In all analyses, mortality is taken up to the date NSW mortality data were received.

The different primary causes of death were classified into a number of categories: drug overdose, trauma (e.g. gunshot, hanging, injuries), cancer, HIV/AIDS or its complications, other medical complications, or hepatitis or its complications.

Treatment exposure

Treatment data for both states were obtained by a request to the bodies administering methadone and buprenorphine treatment: the Pharmaceutical Services Branch, NSW Health and Drug and Alcohol Services South Australia. For all methadone and buprenorphine treatment episodes undertaken by study participants since randomization to the original study, episode start and end dates, type of treatment, and information on the medication dosing point were requested. This information was obtained through database search by patient name and identifier number in NSW and via hand-searching of clinical records by name in SA and forwarded electronically to NDARC.

Treatment data were then sorted into discrete 'episodes' of treatment, where a new episode commenced if the subject entered opioid maintenance treatment more than 7 days after exiting prior treatment, or if the subject changed between methadone and buprenorphine maintenance treatments. In cases where the subject's prescribing doctor or dosing location changed without there being a 7-day interval between exiting and re-entering treatment, this was considered to be a continuous episode of treatment. Episodes of treatment were coded either as methadone treatment longer than 14 days, buprenorphine treatment longer than 14 days and/or opioid (methadone or buprenorphine) maintenance treatment longer than 7 days. The first 14 days of treatment is generally considered to be the highest risk time of methadone maintenance treatment [17], and this same period of time was also applied to buprenorphine treatment for consistency. The cut-off period of 7 days was selected as this is the approximate duration of physical heroin withdrawal symptoms [18] and the length of several commonly used out-patient heroin withdrawal regimens in use in Australia [19,20]. It should be noted that exposure to buprenorphine treatment was anticipated to be less than methadone treatment, because buprenorphine treatment became more accessible only gradually in Australia after its registration in 2000 and subsidization through the Pharmaceutical Benefits Scheme from 2001 [21]. However, all participants randomized originally to buprenorphine treatment were permitted to remain in this treatment until the drug was registered officially.

Statistical analyses

Analyses were conducted using SAS version 9.1 and Excel 2003. Initial tests included basic descriptive analysis, *t*-tests and χ^2 tests. In survival analysis, log-rank tests were used and participants still alive at the analysis point (2 February 2006) were censored. For survival regression models, possible predictors of mortality were identified through literature searches and obtained through the study baseline interview data and the longitudinal data of treatment exposure.

Predictors of mortality were investigated using proportional hazards survival analysis models. Those variables with log-rank *P*-values less than 0.25 in univariate regressions, the original randomized study group variable, and all interaction terms between the variables were retained for consideration in the proportional hazards survival model. Backwards stepwise elimination was used, commencing with the least significant interaction terms and progressing to the main effects. Variables with Wald *P*-values of less than 0.05 were retained in the model. If an interaction term was retained, the two main effects for which the interaction was being considered were also retained in the model. The final model was then examined for possible violations of the proportional hazards assumption.

Ethics approval to conduct the present mortality study was received from UNSW Human Research Ethics Committee and the Royal Adelaide Hospital Ethics Committee.

RESULTS

Sample characteristics

A total of 200 participants were randomized to buprenorphine and 205 participants to methadone. The sample was 69% male, median 28 years of age (18–58 years). Five per cent classified themselves as of Aboriginal or Torres Strait Islander (ATSI) origin, 50% had completed 9–10 years of education and 66% were unemployed at study entry. At baseline, participants were using a median of 2.5 'hits' or 'shots' of heroin per day, and had used a median of four different drug categories in the month before study entry. There were no significant differences between the randomized groups in demographics or drug use variables [13].

Treatment exposure in the follow-up period

Fifty-three per cent of participants remained in treatment for the full 3 months of randomized study treatment. The follow-up period included the period of randomized treatment until the mortality data extraction on 2 February 2006, and amounted to 3394 person-years. There was no difference over the follow-up period in percentage time

Table 1 Predictors of mortality, adjusted multivariate statistics.

Variable description	Test statistic (LR χ^2_1)	P-value	HR (95% CI)
Age (years)	2.32	0.13	NR
ATSI origin (yes or no)	7.20	0.0073	5.32 (1.89, 14.95)
Dependence severity (score/15)	6.86	0.0088	NR
Level of heroin use (uses/day)	9.05	0.0026	NR
Randomized group (MMT or Bup)	6.19	0.013	NR
No. of opioid treatment episodes	7.60	0.0058	0.72 (0.56, 0.93)
Interactions*			
Dependence severity \times heroin use	11.44	0.00072	0.88 (0.83, 0.95)
Randomized group \times age	5.66	0.017	0.89 (0.81, 0.98)

*Interaction terms between all variables were considered, but for brevity only those remaining in the final model have been reported here. Hazard ratios (HR) have not been reported for the individual variables that make up significant interaction terms in the model, although these individual variables remained in the model. LR = likelihood ratio, NR = not reported, MMT = methadone maintenance treatment, Bup buprenorphine.

exposure to opioid maintenance treatment episodes greater than 7 days ($t = 0.64$, $P = 0.52$) across randomized groups. Participants spent a median of 43% of follow-up time in episodes of maintenance treatment lasting longer than 7 days, across a median of two episodes.

Significant differences were noted in the exposure to methadone and buprenorphine between the randomized treatment groups. Participants randomized to methadone treatment were significantly more likely to spend greater percentage follow-up time in methadone treatment episodes longer than 14 days ($t = 4.83$, $P < 0.0001$), and participants randomized to buprenorphine were similarly significantly more likely to spend longer time in buprenorphine treatment episodes longer than 14 days ($Z = 11.45$, $P < 0.0001$).

Mortality

There were 30 deaths in the follow-up period (16 in the buprenorphine randomized group, 14 in the methadone randomized group), with an overall mortality rate of 8.84 deaths per 1000 person-years of follow-up.

Twenty-seven deaths definitely occurred while participants were not registered in opioid maintenance pharmacotherapy—a mortality rate of 14.29 deaths per 1000 person-years while 'out of treatment'. Three deaths occurred while a pharmacotherapy treatment episode was still officially 'open' (1.99 deaths per 1000 person-years), but in two of these cases we considered their actual treatment status at death uncertain: one subject died of complications of opioid toxicity over a year before their episode of buprenorphine treatment was officially completed, while the second died from cancer approximately 3 years before their episode of methadone treatment was officially terminated. The final fatal case in an open episode of treatment died from multi-drug toxicity

555 days after commencing methadone. If we assume that this was the only death 'during treatment', the mortality rate is 0.66 per 1000 person-years.

There was a median of almost a year (355 days) between the completion of an opioid maintenance treatment episode and death. One death (by gunshot wound) occurred 3 days after treatment completion; no other deaths occurred within a fortnight of treatment completion. One death (by heroin toxicity) occurred during naltrexone treatment for opioid withdrawal.

Predictors of mortality during follow-up

The following variables were excluded at the univariate stage on the results of log-rank tests ($P > 0.25$): sex, highest level of education, baseline employment status, baseline marital status, months of heroin use prior to study, level of polydrug use, level of risky injecting practices, level of injection-related problems, whether subject completed initial study treatment (91 days) and number of methadone treatment episodes prior to study entry.

The regression model initially included eight main effects and 28 associated interaction terms. Backwards stepwise regression was used, allowing for missing values. The percentage time spent in opioid treatment greater than 7 days and both the percentage time and number of treatment episodes for more than 14 day methadone and buprenorphine treatment were excluded during the modelling process for $P \geq 0.05$. The final model showed no major violations of the proportional hazards assumption. Table 1 shows all those variables included in the final model.

Controlling for all other factors in the model, exposure to every additional treatment episode of methadone or buprenorphine treatment lasting longer than 7 days, reduced the risk of death on average by 28% [95% confidence interval (CI) 7–44%]. Participants identifying as

Aboriginal or Torres Strait Islander origin had 5.32 times the risk of death of non-Aboriginal or Torres Strait Islander participants, controlling for other model factors (95% CI 1.89–14.95).

Interestingly, among more dependent participants using more heroin at baseline, the risk of death during follow-up was 12% lower (95% CI: 5–18%) than less dependent, less frequent heroin users at baseline. *Post hoc* exploratory analyses suggested that this might have been related to more dependent and heavier heroin users being more likely to spend more time in opioid maintenance treatment. Participants with the top 50% of dependence severity and the top 50% of heroin use at baseline spent significantly more time in opioid maintenance treatment longer than 7 days, compared to those participants in the lower 50% of both categories (median 54.36% versus 37.13% of follow-up, $t = 2.17$, $P = 0.031$).

Among older participants randomized to buprenorphine treatment at treatment entry, the risk of death during the follow-up period was 11% lower (95% CI: 2–19%) than younger participants who were randomized to methadone at study entry. *Post hoc* analyses of this association suggested that this could have been related to the time spent in buprenorphine treatment. Older participants randomized to buprenorphine treatment spent significantly more time in buprenorphine treatment longer than 14 days (median 7.17% versus 0% of follow-up, $Z = 8.45$, $P < 0.0001$), and significantly less time in methadone treatment longer than 14 days (median 8.81% versus 29.50% of follow-up, $t = 2.05$, $P = 0.042$) compared to younger participants randomized to methadone treatment. These subject groups did not significantly differ on the time spent in either opioid maintenance treatment longer than 7 days (median 45.85% versus 33.30% of follow-up, $t = 1.43$, $P = 0.16$).

Causes of death

Drug overdose or related complications were the most common cause of death in the 30 deceased participants, accounting for 40% of the deaths. Causes of death and mortality rates are presented in Table 2.

DISCUSSION

A greater number of treatment episodes lasting longer than 7 days, regardless of whether this was methadone or buprenorphine, increased long-term survival. There appeared to be no differential effect of either treatment—it was exposure to stable treatment that was important. These results support previous studies finding reduced mortality risk during opioid maintenance treatment [3,22–25]. Participants identifying as Aboriginal or Torres Strait Islander origin were over five times

Table 2 Causes of death.

Cause of death	No (%)	Mortality rate (deaths per 1000 py)
Drug overdose or its sequelae	12 (40%)	3.54
Trauma (e.g. gunshot wounds, hanging, asphyxia)	6 (20%)	1.77
Other medical reasons (e.g. hepatic encephalopathy, endocarditis)	3 (10%)	0.88
Cancer	2 (7%)	0.59
AIDS or its complications	2 (7%)	0.59
Cause of death unknown	5 (17%)	1.47
Total	30	8.84

py = person-years.

more likely to die than non-Aboriginal or Torres Strait Islander participants. Indigenous status remains a well-recognized mortality risk in Australia [26].

Two significant interaction terms in our regression model showed some interesting effects. More severely dependent, heavier heroin-using participants were less likely to be dead at follow-up. This unexpected finding could be explained partially by these participants spending more time in stable maintenance treatment episodes and thus reducing their mortality risk. Indeed, more dependent, heavier heroin-using participants at baseline spent significantly more study follow-up time in opioid maintenance treatment longer than 7 days, compared to less dependent, less heroin-using participants ($t = 2.17$, $P = 0.031$). This is a promising finding, implying that, at least in the NSW and South Australian clinical settings, those people who have the greatest need of opioid maintenance treatment are able to access it; and by so doing, they reduce their mortality risk.

Older participants randomized to buprenorphine treatment were less likely to be dead at follow-up. While older participants randomized to buprenorphine treatment spent significantly more time in buprenorphine maintenance treatment longer than 14 days ($Z = 8.45$, $P < 0.0001$), they did not spend significantly more time in opioid maintenance treatment longer than 7 days ($t = 1.43$, $P = 0.16$) and spent significantly less time in methadone maintenance treatment longer than 14 days ($t = 2.05$, $P = 0.042$) compared to younger participants randomized to methadone treatment. It appears that the older people randomized to buprenorphine may have benefited more in terms of their survival from exposure to buprenorphine rather than exposure to methadone treatment. Further research is needed to clarify this.

It has been questioned whether methadone and buprenorphine maintenance treatment had different long-term mortality outcomes, but so far this question

has been addressed only in self-selected treatment samples [10,11]. Previous studies did not allow for direct control for characteristics of the respective treatment populations, which probably differed in other important ways that impact upon mortality risk. This is the first study that has examined mortality risk in a randomized controlled trial of these two pharmacotherapies. In this randomized study we can see that the original study randomization had no direct impact on long-term mortality, except in the case of older participants randomized to buprenorphine treatment, who showed improved survival.

Seven per cent of participants died during follow-up, giving a crude mortality rate of 8.84 deaths per 1000 person-years of follow-up. Only one death occurred during opioid maintenance treatment (methadone) and an additional death occurred during naltrexone withdrawal treatment. Deaths were predominantly from opioid overdose or trauma, consistent with the literature [27], and the mortality rates for these causes of death were comparable to rates reported previously [28]. The low AIDS-related mortality is a clear reflection of the low prevalence of HIV in the Australian injecting drug user population [29]. While the impact of the high hepatitis C prevalence in Australian opioid-dependent was not reflected in the primary causes of death, it and other comorbid conditions have been shown to be a significant source of morbidity in this population [30,31] and may have contributed to some of the deaths.

Limitations

The primary limitation of this study concerns the ease of availability of buprenorphine treatment exposure over time, as the original study was commenced prior to buprenorphine treatment registration in Australia. The ideal situation to examine the impact of methadone and buprenorphine on mortality would be in a long-term randomized study where patients had ready access to their randomized treatment over time but were not permitted to change between treatments. As this is clearly not feasible, the current study design would seem to be the next best option. As there were no significant differences between study groups at baseline, we were able to control for patient characteristics in our analyses, and found no differential effect of the time that was spent in buprenorphine versus methadone treatment.

Treatment exposure other than opioid maintenance pharmacotherapies such as naltrexone was not measured routinely. It is possible that exposure to other treatments had an impact on mortality, but as methadone and buprenorphine account for the great majority of opioid dependence treatment in Australia we expect this effect to be a minor one.

CONCLUSIONS

This study examined mortality risk in a randomized controlled trial of methadone versus buprenorphine maintenance treatment. Exposure to episodes of opioid maintenance treatment reduces mortality in opioid-dependent participants, and there did not appear to be a differential effect of methadone or buprenorphine exposure on mortality. Only one death occurred during an opioid maintenance treatment episode. Interestingly, more dependent, heavier heroin users had a reduction in mortality risk associated with greater exposure to opioid maintenance treatment than less heavy or dependent users; further, older participants randomized to buprenorphine treatment had significantly improved survival, perhaps from an increased exposure to buprenorphine treatment. Causes of death were consistent with those reported previously in the literature. While exposure to methadone and buprenorphine treatment after the conclusion of the randomized controlled trial were influenced by the availability of treatments over time, we have demonstrated that greater access to opioid maintenance treatment episodes, whether buprenorphine or methadone, reduces mortality risk in opioid-dependent people.

Acknowledgements

The authors would like to acknowledge Wayne Hall, James Bell, Pia Salmalanien, Robyn Vial and Geoff Anderson for their assistance during this study and in the preparation of the paper. The original RCT study was funded by the Australian Government Department of Health and Ageing, NSW Health Department, South Australian Department of Health and the National Drug and Alcohol Research Centre. In the current study, the primary author was supported by a PhD scholarship from the National Drug and Alcohol Research Centre at the University of New South Wales, Sydney. NDARC is core-funded by the Australian Government Department of Health and Ageing.

References

1. English D. R., Holman C. D. J., Milne E., Winter M. G., Hulse G. K., Codde J. P. *et al.* *The Quantification of Drug Caused Morbidity and Mortality in Australia*. Canberra: Commonwealth Department of Human Services and Health; 1995.
2. Hulse G. K., English D. R., Milne E., Holman C. D. J. The quantification of mortality resulting from the regular use of illicit opiates. *Addiction* 1999; 94: 221-9.
3. Gronbladh L., Ohlund L. S., Gunne L. M. Mortality in heroin addiction: impact of methadone treatment. *Acta Psychiatr Scand* 1990; 82: 223-7.
4. Caplehorn J. R. M., Drummer O. H. Mortality associated with New South Wales methadone programs in 1994. lives lost and saved. *Med J Aust* 1999; 170: 104-9.

5. Oppenheimer E., Tobutt C., Taylor C., Andrew T. Death and survival in a cohort of heroin addicts from London clinics: a 22-year follow-up study. *Addiction* 1994; **89**: 1299–308.
6. Frischer M., Goldberg D., Rahman M., Berney L. Mortality and survival among a cohort of drug injectors in Glasgow, 1982–1994. *Addiction* 1997; **92**: 419–27.
7. Quan V. M., Vongchak T., Jittiwutikarn J., Kawichai S., Srirak N., Wiboonnatakul K. et al. Predictors of mortality among injecting and non-injecting HIV-negative drug users in northern Thailand. *Addiction* 2007; **102**: 441–6.
8. O'Driscoll P. T., McGough J., Hagan H., Thiede H., Critchlow C., Alexander E. R. Predictors of accidental fatal drug overdose among a cohort of injection drug users. *Am J Public Health* 2001; **91**: 984–7.
9. Walsh S. L., Preston K. L., Stitzer M. L., Cone E. J., Bigelow G. E. Clinical pharmacology of buprenorphine: ceiling effects at high doses. *Clin Pharmacol Ther* 1994; **55**: 569–80.
10. Auriacombe M., Franques P., Tignol J. Deaths attributable to methadone versus buprenorphine France. *JAMA* 2001; **285**: 3.
11. Gibson A., Degenhardt L. *Mortality Related to Naltrexone in the Treatment of Opioid Dependence: A Comparative Analysis*. Sydney: National Drug and Alcohol Research Centre; 2005.
12. Gibson A., Degenhardt L. Mortality related to pharmacotherapies for opioid dependence: a comparative analysis of coronial records. *Drug Alcohol Rev* 2007; **26**: 405–10.
13. Mattick R. P., Ali R., White J. M., O'Brien S., Wolk S., Danz C. Buprenorphine versus methadone maintenance therapy: a randomized double-blind trial with 405 opioid-dependent patients. *Addiction* 2003; **98**: 441–52.
14. American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*, 4th edn, edited text revision. Washington, DC: American Psychiatric Association; 2000.
15. Darke S., Hall W., Wodak A., Heather N., Ward J. Development and validation of a multi-dimensional instrument for assessing outcome of treatment among opiate users: the Opiate Treatment Index. *Br J Addict* 1992; **87**: 733–42.
16. Gossop M., Darke S., Griffiths P., Hando J., Powis B., Hall W. et al. The Severity of Dependence Scale (SDS): psychometric properties of the SDS in English and Australian samples of heroin, cocaine and amphetamine users. *Addiction* 1995; **90**: 607–14.
17. Caplehorn J. R. M. Deaths in the first two weeks of maintenance treatment in NSW in 1994: identifying cases of iatrogenic methadone toxicity. *Drug Alcohol Rev* 1998; **17**: 9–17.
18. Lintzeris N., Clark N., Winstock A., Dunlop A., Muhleisen P., Gowing L. et al. *National Clinical Guidelines and Procedures for the Use of Buprenorphine in the Treatment of Heroin Dependence*. Canberra: Australian Government Department of Health and Ageing; 2006.
19. Lintzeris N., Bell J., Bammer G., Jolley D. J., Rushworth L. A randomized controlled trial of buprenorphine in the management of short-term ambulatory heroin withdrawal. *Addiction* 2002; **97**: 1395–404.
20. Gibson A. E., Doran C. M., Bell J. R., Ryan A., Lintzeris N. A comparison of buprenorphine treatment in clinic and primary care settings: a randomised trial. *Med J Aust* 2003; **179**: 38–42.
21. Lintzeris N., Ritter A., Panjari M., Clark N., Kutin J., Bammer G. Implementing buprenorphine treatment in community settings in Australia: experiences from the Buprenorphine Implementation Trial. *Am J Addict* 2004; **13**: S29–S41.
22. Caplehorn J. R. M., Dalton M. S. Y. N., Cluff M. C., Petrenas A. M. Retention in methadone maintenance and heroin addicts' risk of death. *Addiction* 1994; **89**: 203–7.
23. Zanis D. A., Woody G. E. One-year mortality rates following methadone treatment discharge. *Drug Alcohol Depend* 1998; **52**: 257–60.
24. Esteban J., Gimeno C., Barril J., Aragones A., Climent J. M., de la Cruz Pellin M. Survival study of opioid addicts in relations to its adherence to methadone maintenance treatment. *Drug Alcohol Depend* 2003; **70**: 193–200.
25. Brugal M. T., Domingo-Salvany A., Puig R., Barrio G., Garcia de Olalla P., de la Fuente L. Evaluating the impact of methadone maintenance programmes on mortality due to overdose and aids in a cohort of heroin users in Spain. *Addiction* 2005; **100**: 981–9.
26. Australian Institute of Health and Welfare. *Australia's Health, 2006*. Canberra: Australian Institute of Health and Welfare; 2006.
27. Darke S., Degenhardt L., Mattick R. *Mortality Amongst Illicit Drug Users*. Melbourne: Cambridge University Press; 2007.
28. Degenhardt L., Hall W., Lynskey M., Warner-Smith M. Illicit drug use. In: Ezzati M., Lopez A. D., Rodgers A., Murray R., editors. *Comparative Quantification of Health Risks: Global and Regional Burden of Disease Attributable to Selected Major Risk Factors*, chapter 13. Geneva: World Health Organization; 2004, p. 1109–76.
29. Aceijas C., Stimson G. V., Hickman M., Rhodes T. Global overview of injecting drug use and HIV infection among injecting drug users. *AIDS* 2004; **18**: 2295–303.
30. Darke S., Kaye S., Dufflour J. Systemic disease among cases of fatal opioid toxicity. *Addiction* 2006; **101**: 1299–305.
31. Wong J. B., McQuillan G. M., McHutchison J. G., Poynard T. Estimating future hepatitis C morbidity, mortality and costs in the United States. *Am J Public Health* 2000; **90**: 1562–9.

This document is a scanned copy of a printed document. No warranty is given about the accuracy of the copy. Users should refer to the original published version of the material.

National and State Treatment Need and Capacity for Opioid Agonist Medication-Assisted Treatment

Christopher M. Jones, PharmD, MPH, Melinda Campopiano, MD, Grant Baldwin, PhD, MPH, and Elinore McCance-Katz, MD, PhD

The abuse of prescription opioid pain relievers (OPRs) and illicit opioids such as heroin contributes to significant morbidity and mortality in the United States. After an unprecedented increase in overdose deaths, primarily involving OPRs, drug overdose death became the leading cause of injury death in the United States in 2009.¹ Underlying many of these deaths is a history of substance use disorder.²⁻⁴ Indeed, rates of substance abuse treatment admissions for OPR abuse have increased in parallel with OPR overdose deaths.⁵ Recently, concerns have focused on the relationship between OPR abuse and heroin initiation and subsequent increases in heroin use and deaths as well as transitions to injection drug use and increases in rates of HCV infections.⁶⁻¹¹

Opioid agonist medication-assisted treatment (OA-MAT) with methadone or buprenorphine is the most effective treatment for opioid use disorder.¹² OA-MAT has been shown to increase treatment retention and to reduce opioid use, risk behaviors that transmit HIV and hepatitis, and mortality.¹³⁻²⁰ Historically, methadone, via federally regulated opioid treatment programs (OTPs), has been the main source of OA-MAT. Research has demonstrated significant access barriers to methadone, including waiting lists for treatment entry, limited geographic coverage, limited insurance coverage, and the requirement that many patients receive methadone at the OTP daily.²¹⁻²⁴

To expand OA-MAT to a more geographically diverse population and integrate addiction treatment into general medical settings, Congress passed the Drug Addiction Treatment Act of 2000 (DATA 2000).²⁵ DATA 2000 permits qualified physicians to request a waiver (referred to in this article as a DATA waiver) from the Controlled Substances Act to treat opioid addiction outside of an OTP. Specifically, the law allows physicians to request a DATA waiver from the Substance Abuse and Mental Health Services Administration (SAMHSA) to prescribe certain Schedule

Objectives. We estimated national and state trends in opioid agonist medication-assisted treatment (OA-MAT) need and capacity to identify gaps and inform policy decisions.

Methods. We generated national and state rates of past-year opioid abuse or dependence, maximum potential buprenorphine treatment capacity, number of patients receiving methadone from opioid treatment programs (OTPs), and the percentage of OTPs operating at 80% capacity or more using Substance Abuse and Mental Health Services Administration data.

Results. Nationally, in 2012, the rate of opioid abuse or dependence was 891.8 per 100 000 people aged 12 years or older compared with national rates of maximum potential buprenorphine treatment capacity and patients receiving methadone in OTPs of, respectively, 420.3 and 119.9. Among states and the District of Columbia, 96% had opioid abuse or dependence rates higher than their buprenorphine treatment capacity rates; 37% had a gap of at least 5 per 1000 people. Thirty-eight states (77.6%) reported at least 75% of their OTPs were operating at 80% capacity or more.

Conclusions. Significant gaps between treatment need and capacity exist at the state and national levels. Strategies to increase the number of OA-MAT providers are needed. (*Am J Public Health.* 2015;105:e55-e63. doi:10.2105/AJPH.2015.302664)

III-V opioids approved by the US Food and Drug Administration for the treatment of opioid addiction.²⁵ The Drug Enforcement Administration then assigns separate registration numbers to identify DATA-waived physicians. These physicians can initially prescribe to as many as 30 patients. As of 2007, DATA-waived physicians can after 1 year submit a revised waiver to prescribe to as many as 100 patients. In October 2002, the Food and Drug Administration approved 2 buprenorphine formulations (a single entity and a combination with naloxone) as the first products that could be used under DATA 2000.

Similar to methadone, barriers exist for patients seeking OA-MAT with buprenorphine. Provider availability and willingness to prescribe, limited insurance coverage, and cost are commonly cited barriers.²⁶⁻³⁰ In addition, provider barriers exist and contribute to the limited number of physicians seeking a DATA waiver and the underuse of buprenorphine among those who had obtained a waiver. Consistently

identified barriers include willingness to prescribe, low provider confidence in addressing addiction, limited access to addiction experts, lack of institutional or office support, lack of behavioral health services, and reimbursement concerns.³¹⁻³⁶ Studies have found that approximately 44% to 66% of DATA-waived physicians actually prescribe buprenorphine; of these prescribers, the majority do not prescribe to their maximum patient limit.^{32,33,35,37,38}

It is thought that access to OA-MAT has not kept pace with the increasing problem of opioid addiction in the United States.^{24,39,40} However, studies have not quantified the gap between OA-MAT treatment need and capacity. We expanded the literature by estimating national and state OA-MAT treatment need and capacity. This information can substantially improve understanding of available OA-MAT resources and treatment gaps and inform policy and programmatic decisions to increase access to an intervention with well-documented public health benefits.

RESEARCH AND PRACTICE

METHODS

The National Survey on Drug Use and Health (NSDUH) provides estimates of the use of alcohol, tobacco, and drugs by the US civilian, noninstitutionalized population aged 12 years or older. Additional information on the NSDUH methodology is available elsewhere.⁴¹ We used public-use-file NSDUH data from 2003 to 2012 and restricted-use NSDUH data from 2009 to 2012.^{42,43}

The National Survey of Substance Abuse Treatment Services (N-SSATS) is an annual survey conducted by SAMHSA that captures detailed information on all known substance abuse treatment facilities throughout the United States, including OTPs. We used data from the 2003 to 2012 N-SSATS public-use files.⁴⁴

SAMHSA maintains information on all DATA-waived physicians such as certification date, state in which they practice, authorized patient limit (30 or 100), and whether they are listed on the SAMHSA buprenorphine treatment locator.⁴⁵ We used information from the program's inception in 2002 through 2012.

Study Variables

We used past-year opioid abuse or dependence to estimate treatment need. NSDUH respondents who report past-year drug use are asked a series of questions modeled after criteria in the *Diagnostic and Statistical Manual of Mental Disorders* (4th edition)⁴⁶ to identify individuals with past-year abuse or dependence on specific substances. For this analysis, we focused on individuals who met criteria for past-year abuse or dependence on opioids (either OPRs or heroin, or both).

To estimate the annual number of patients receiving methadone, we calculated the total number of patients receiving methadone in OTPs on the N-SSATS annual reference date, March 31. In addition, OTPs are asked to report their current outpatient operating capacity on the reference date. For this analysis, we assessed the percentage of OTPs operating at 80% capacity or higher.

To estimate buprenorphine treatment capacity, we calculated the total number of patients each DATA-waived physician could prescribe to, either 30 or 100. We focused on the total number of patients who could be

treated with buprenorphine because this best represents the maximum potential buprenorphine treatment capacity.

Data Analysis

National opioid agonist medication-assisted treatment need and capacity. To estimate treatment need, we generated counts and rates of past-year opioid abuse or dependence by year for 2003 to 2012. For OA-MAT treatment capacity, we calculated by year for 2003 to 2012 cumulative counts and rates of DATA-waived physicians with a 30- or 100-patient limit and total number of potential patients who could be treated with buprenorphine, counts and rates of OTPs in operation annually, and patients receiving methadone in OTPs annually. Rates were per 100 000 people aged 12 years and older, based on data from the US Census Bureau.⁴⁷ We used the unpaired, 2-tailed *t* test to test for statistically significant ($P \leq .05$) differences in annual estimates and rates of past-year opioid abuse or dependence compared with the 2012 estimate.

State opioid agonist medication-assisted treatment need and capacity. To estimate treatment need, we calculated average annual rates of past-year opioid abuse or dependence by state using combined 2009 to 2012 restricted-use NSDUH data. To estimate OA-MAT treatment capacity, we calculated state rates of the maximum number of patients who could be treated with buprenorphine, the number of OTP patients receiving methadone, and the percentage of OTPs operating at 80% or greater capacity. To further elucidate state-level differences in markers of treatment capacity and access, we calculated by state the percentage of DATA-waived physicians with a 100-patient limit and the percentage of physicians listed on the SAMSHA buprenorphine treatment locator (a publicly available resource to help patients identify a potential treatment provider) through December 31, 2012. State rates are per 1000 people aged 12 years and older. We used the Pearson correlation coefficient to assess the relationship between state rates of past-year opioid abuse or dependence and OA-MAT treatment capacity.

We conducted all analyses with SAS version 9.3 (SAS Institute, Cary, NC), SAS-callable SUDAAN (RTI International, Research Triangle Park, NC), SPSS Complex Samples (IBM

Corporation, Armonk, NY), and Microsoft Excel 2010 (Microsoft Corporation, Redmond, WA).

RESULTS

At the national level, past-year opioid abuse or dependence increased significantly between 2003 and 2012 (Table 1). In 2003, an estimated 1 507 130 people aged 12 years and older met criteria for opioid abuse or dependence; by 2012, this had increased to 2 319 213 people. The rate of past-year opioid abuse or dependence increased significantly from a rate of 634.1 per 100 000 people aged 12 years and older in 2003 to a rate of 891.8 in 2012.

Treatment capacity also increased during the study period. The cumulative number of DATA-waived physicians with a 30-patient limit increased from 1800 in 2003 to 16 095 by 2012. The cumulative number of DATA-waived physicians with a 100-patient limit increased from 1937 in 2007 to 6103 in 2012. By 2012, the maximum number of patients who could be treated with buprenorphine in the United States was 1 093 150, a rate of 420.3 per 100 000 people aged 12 years and older.

The number of OTPs operating during the study period was relatively stable, with between 1067 and 1239 OTPs operating each year. The number and rate of patients receiving methadone in OTPs increased annually between 2003 and 2012, from 227 003 to 311 718, a rate of 95.5 per 100 000 people aged 12 years and older in 2003 to a rate of 119.9 in 2012. In 2012, 3.5 times as many patients could be treated with buprenorphine as were receiving methadone in OTPs.

Figure 1 depicts annual national trends in past-year opioid abuse or dependence and OA-MAT treatment capacity as represented by the number of patients receiving methadone each year in OTPs and the cumulative maximum number of patients who could be treated with buprenorphine. In 2012, the difference between the number of people with past-year opioid abuse or dependence and combined methadone and buprenorphine treatment capacity was approximately 914 000 individuals.

Table 2 compares rates at the state level of past-year opioid abuse or dependence,

RESEARCH AND PRACTICE

TABLE 1—Number and Rates of Past-Year Opioid Abuse or Dependence and Opioid Agonist Medication-Assisted Treatment Capacity, by Year: United States, 2003–2012

Year	Past-Year Opioid Abuse or Dependence		DATA-Waived Physicians, No. (Rate ^b)		Maximum Potential Buprenorphine Patients, No. (Rate ^b)	Opioid Treatment Programs/Year, No. (Rate ^b)	Patients Receiving Methadone in Opioid Treatment Programs/Year, No. (Rate ^b)
	Estimate (95% CI)	Rate ^a (95% CI)	With 30-Patient Limit	With 100-Patient Limit			
2003	1 507 130 ^b (1 303 742, 1 710 518)	634.1 ^b (552.8, 727.2)	1 800 (0.8)	0 (0)	54 000 (22.7)	1 067 (0.4)	227 003 (95.5)
2004	1 661 297 ^b (1 475 145, 1 847 449)	690.7 ^b (619.1, 770.6)	3 219 (1.3)	0 (0)	96 570 (40.2)	1 070 (0.4)	240 961 (100.2)
2005	1 690 219 ^b (1 468 703, 1 911 735)	694.9 ^b (609.6, 792.1)	5 419 (2.2)	0 (0)	162 570 (66.8)	1 069 (0.4)	235 836 (97.0)
2006	1 842 275 ^b (1 611 676, 2 072 874)	748.8 (662.5, 846.3)	7 887 (3.2)	0 (0)	236 610 (96.2)	1 203 (0.5)	258 752 (105.2)
2007	1 854 894 ^b (1 541 794, 2 167 993)	748.4 (634.1, 883.2)	8 566 (3.5)	1 937 (0.8)	450 680 (181.8)	1 108 (0.4)	262 684 (106.0)
2008	1 887 196 ^b (1 679 588, 2 094 804)	755.4 (674.0, 846.7)	11 029 (4.4)	2 509 (1.0)	581 770 (232.9)	1 132 (0.5)	268 071 (107.3)
2009	2 053 570 (1 807 374, 2 299 767)	815.5 (721.5, 921.6)	12 228 (4.9)	3 380 (1.3)	704 840 (279.9)	1 239 (0.5)	285 686 (113.5)
2010	2 105 757 (1 761 273, 2 450 242)	830.3 (707.3, 974.5)	13 344 (5.3)	4 441 (1.8)	844 420 (332.9)	1 166 (0.5)	299 643 (118.1)
2011	2 097 321 (1 837 497, 2 357 144)	814.2 (718.0, 923.1)	14 656 (5.7)	5 230 (2.0)	962 680 (373.7)	1 189 (0.5)	307 780 (119.5)
2012	2 319 213 (1 980 730, 2 657 695)	891.8 (772.8, 1028.9)	16 095 (6.2)	6 103 (2.3)	1 093 150 (420.3)	1 167 (0.4)	311 718 (119.9)

Note. CI = confidence interval; DATA = Drug Addiction Treatment Act of 2000.

Source. Data are from the National Survey on Drug Use and Health, the National Survey of Substance Abuse Treatment Services, and the SAMHSA DATA 2000 Waiver Program.

^aRates are per 100 000 people aged ≥ 12 years.

^bPast-year opioid abuse or dependence estimate or rate is statistically significantly different than 2012 estimate ($P < .05$).

maximum potential rates of buprenorphine treatment capacity, percentage of DATA-waived physicians with a 100-patient limit, percentage of DATA-waived physicians listed on the buprenorphine treatment locator, and percentage of OTPs operating at 80% or greater capacity by state. Rates of past-year opioid abuse or dependence ranged from 3.4 per 1000 people aged 12 years and older in Kansas to 12.9 in West Virginia. Rates of buprenorphine treatment capacity varied from 0.7 patients per 1000 people aged 12 years and older in South Dakota to 13.8 in Vermont. Forty-eight states and the District of Columbia (96%) had rates of past-year opioid abuse or dependence that were higher than their rates of buprenorphine treatment capacity; 19 states (37%) had a gap of at least 5 per 1000 people.

Through 2012, 27.5% of DATA-waived physicians nationally had a waiver to prescribe to as many as 100 patients. No state had more than 45% of their DATA-waived physicians with a 100-patient limit, with 29 of 51 (56.7%) having 30% or fewer. The percentage of DATA-waived physicians listed on the buprenorphine treatment locator nationally was 55.4%. The percentage by state varied from 19.9% in Vermont to 72.2% in Alabama. Sixteen of 51 (31%) had fewer than 50% of DATA-waived physicians listed on the treatment locator.

Eighty-two percent of OTPs nationally reported operating at 80% or greater capacity in 2012. Of 48 states and the District of Columbia, 13 (26.5%) reported 100% of their OTPs were operating at 80% or greater capacity. Another 25 states (51.0%) reported at least 75% of their OTPs were operating at 80% or greater capacity. Wyoming and North Dakota had no OTPs in 2012.

Figure 2 compares state average annual rates of past-year opioid abuse and dependence for 2009 to 2012 and state rates of OA-MAT capacity (combined maximum number of potential buprenorphine patients and number of patients receiving methadone in OTPs) in 2012. The correlation between state rates of past-year opioid abuse or dependence and OA-MAT capacity was moderately positive ($r=0.41$; $P=.003$).

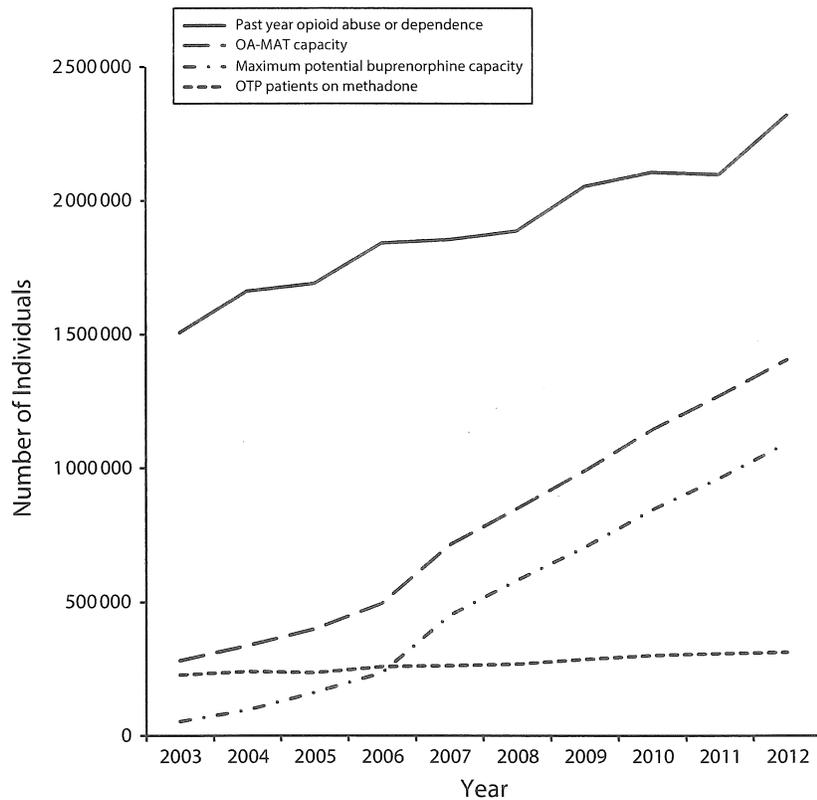
DISCUSSION

This study's findings show that potential OA-MAT treatment capacity increased markedly between 2003 and 2012—driven largely by the increase in number of DATA-waived physicians. Nonetheless, our findings indicate that the large gap in treatment need and capacity did not significantly close as the opioid epidemic took hold. In 2012, a gap of nearly 1

million people existed nationally, which represents a best-case scenario in which all DATA-waived physicians are prescribing at their maximum patient limit. Previous research has indicated that this is not the case.^{32,33,35,37,38} Indeed, a random survey of DATA-waived providers in 2008 estimated that the number of patients currently receiving buprenorphine represented 57% of potential capacity.⁴⁸ Applying the estimate of 57% to the 2012 data in our study, this represents roughly 623 000 current buprenorphine patients. If we base capacity on a provider's voluntary listing on the buprenorphine treatment locator—or approximately 55% of DATA-waived providers—we estimate that slightly more than 709 000 patients are receiving buprenorphine. These estimates suggest a gap between treatment need and capacity of 1.4 and 1.3 million in 2012, respectively.

At the state level, our findings demonstrate significant variation in treatment need and capacity, with a majority of states having higher rates of treatment need than treatment capacity. With respect to potential buprenorphine treatment capacity, the majority of states had a gap of at least 3 patients per 1000 people. Moreover, the majority of OTPs were operating at 80% or more capacity, suggesting that they would not be able to handle a significant

RESEARCH AND PRACTICE



Note. OA-MAT = opioid agonist medication-assisted treatment; OTP = opioid treatment program.

FIGURE 1—Trends in past-year opioid abuse or dependence and opioid agonist medication-assisted treatment capacity: United States, 2003–2012.

number of new patients. The moderate correlation between rates of past-year opioid abuse or dependence and OA-MAT capacity underscores the disconnect between state treatment need and capacity. Previous studies have identified a number of factors driving the differential adoption and diffusion of medication-assisted addiction treatment. These factors include differences in Medicaid and other insurance coverage, state licensing and regulation of treatment facilities, facility funding sources, and parity laws.^{49,50} These policies may have contributed to the state variation in OA-MAT capacity, percentage of providers seeking a 100-patient limit, and percentage of providers listed on the buprenorphine treatment locator seen in this study. It is worth noting that states in the northeastern United States tended to have greater potential OA-MAT capacity than states in other regions. Many were early adopters of

buprenorphine-based MAT and have implemented a number of unique programs to expand OA-MAT capacity.^{50–52}

As demonstrated in this study, far more patients are in need of treatment than can currently access it. Studies have shown that a minority of patients in need of treatment actually seek or receive it.⁴¹ Primary reasons include inadequate accessibility or availability, stigma, a belief that they can handle the problem without treatment, not being ready to stop using substances, lack of health insurance coverage, privacy concerns, and treatment cost.^{1,41} Through the Patient Protection and Affordable Care Act,⁵³ several changes will help address some of these patient-level barriers. Clinical services for substance use disorders are an essential health benefit that must be covered by insurers, with specific coverage varying by state and health plan. In addition, the expansion of Medicaid in 27 states and the

District of Columbia as of October 2014 means that individuals who previously did not qualify for Medicaid—many with substance use disorders—will have coverage for substance abuse treatment in the states that expand. Although these changes help to remove certain barriers, this study highlights the fundamental need for a sufficient supply of trained clinicians to provide care for these newly covered individuals. Additional efforts are needed to put systems in place to better identify people in need of treatment and to connect people with the right treatment when they seek care. Moreover, efforts to reduce the stigma of addiction and the use of medications to treat addiction must continue to be supported. It has been well documented that addiction and MAT-related social stigma contribute to social isolation, reduce help-seeking behaviors, and undermine long-term recovery.⁵⁴ Sufficient capacity is irrelevant if stigma prevents patients from seeking treatment.

A series of complementary, clinician-focused practice and policy changes at both the national and the state levels will be required to address the treatment gap identified in this study. In addition to changes under the Affordable Care Act, changes that address administrative barriers such as clinician reimbursement strategies that provide appropriate and timely payment for services are needed. Restrictions imposed on pharmacy benefits such as preauthorization, “fail-first,” quantity limits, and lifetime limits on duration of therapy intended to support appropriate cost-effective prescribing are barriers for both patients and providers and contribute to reduced uptake of OA-MAT.^{29,31,32,35} An assessment of these policies for intended and unintended outcomes is needed.

Education of physicians in the diagnosis and management of addiction is inadequate, and low confidence in addressing addiction and administrative factors such as lack of institutional and administrative support are barriers to providing OA-MAT.^{31,32,35,36} Not only does time spent in science-based education in addiction across clinician training need to be improved, support needs to be available to assist trained providers in OA-MAT adoption. Investments in programs that use onsite mentors and access to experienced clinicians can help provide the skills needed to implement office-based treatment.⁵⁵ Adoption of remote forms of behavioral therapy

RESEARCH AND PRACTICE

TABLE 2—Rates of Past-Year Opioid Abuse or Dependence, Maximum Potential Buprenorphine Treatment Capacity, Percentage of DATA-Waived Physicians With 100-Patient Limit, Percentage of DATA-Waived Physicians on Treatment Locator, and Opioid Treatment Program Operating Capacity by State: United States, 2012

Region	Past-Year Opioid Abuse or Dependence, ^a Rate (95% CI)	Maximum Potential Buprenorphine Treatment Capacity, Rate (95% CI)	% of DATA-Waived Physicians		% of OTPs at ≥ 80% Capacity
			100-Patient Limit for Buprenorphine	Listed on Buprenorphine Treatment Locator	
United States	8.3 (7.8, 8.9)	4.1 (4.1, 4.1)	27.5	55.4	82.3
Northeast region					
Connecticut	9.5 (5.7, 15.9)	7.4 (7.3, 7.5)	29.4	53.4	96.8
Maine	10.0 (7.0, 14.0)	13.3 (13.1, 13.5)	33.8	32.1	70.0
Massachusetts	11.7 (7.3, 18.6)	9.9 (9.8, 10.0)	31.0	39.7	90.0
New Hampshire	11.2 (7.3, 18.6)	4.2 (4.1, 4.4)	34.4	46.7	75.0
New Jersey	10.3 (6.8, 15.5)	5.8 (5.7, 5.9)	28.8	62.4	91.4
New York	6.9 (5.5, 8.6)	6.7 (6.6, 6.7)	22.0	59.7	87.0
Pennsylvania	10.3 (8.1, 12.9)	6.5 (6.5, 6.6)	30.6	48.1	87.3
Rhode Island	12.0 (7.9, 18.1)	10.0 (9.8, 10.2)	35.3	46.1	83.3
Vermont	9.9 (6.8, 14.5)	13.8 (13.5, 14.1)	22.3	19.9	100
Midwest region					
Illinois	6.0 (4.6, 7.8)	2.2 (2.1, 2.2)	24.2	60.1	76.9
Indiana	12.6 (8.6, 18.4)	2.8 (2.8, 2.9)	34.3	62.9	83.3
Iowa	3.5 (2.6, 4.8)	1.0 (0.9, 1.0)	21.8	47.3	50.0
Kansas	3.4 (1.9, 5.9)	1.7 (1.7, 1.8)	18.6	62.9	100
Michigan	9.2 (7.3, 11.6)	5.3 (5.2, 5.3)	30.3	50.4	73.3
Minnesota	4.1 (2.3, 7.3)	2.0 (1.9, 2.0)	22.6	40.0	92.9
Missouri	8.3 (5.4, 12.8)	2.2 (2.1, 2.2)	30.6	51.9	80.0
Nebraska	6.6 (3.7, 11.8)	1.2 (1.2, 1.3)	18.2	54.6	100
North Dakota	4.1 (2.6, 6.3)	2.0 (1.9, 2.1)	24.0	48.0	No OTPs
Ohio	10.0 (8.1, 12.3)	4.0 (3.9, 4.0)	34.7	59.8	100
South Dakota	4.7 (2.2, 10.0)	0.7 (0.6, 0.8)	0.0	37.5	0.0
Wisconsin	4.9 (2.9, 8.4)	3.3 (3.2, 3.3)	27.6	48.3	100
South region					
Alabama	6.4 (4.1, 10.0)	4.0 (3.9, 4.0)	41.8	72.2	75.0
Arkansas	11.6 (7.0, 18.9)	1.7 (1.6, 1.7)	39.4	62.0	100
Delaware	10.8 (7.1, 16.3)	5.1 (5.0, 5.3)	33.3	62.7	100
District of Columbia	6.7 (3.6, 12.3)	5.8 (5.6, 6.0)	17.1	61.8	100
Florida	7.7 (6.0, 9.8)	4.2 (4.2, 4.3)	28.5	72.0	75.0
Georgia	4.8 (2.8, 8.4)	3.2 (3.2, 3.2)	26.2	66.5	81.3
Kentucky	11.7 (8.3, 16.5)	5.8 (5.7, 5.9)	42.0	63.8	63.6
Louisiana	9.4 (7.1, 12.4)	4.1 (4.1, 4.2)	36.4	65.7	75.0
Maryland	9.9 (5.7, 17.2)	7.9 (7.8, 7.9)	27.7	51.7	86.3
Mississippi	8.6 (5.7, 12.9)	3.8 (3.7, 3.9)	44.8	71.4	100
North Carolina	10.3 (5.5, 19.1)	2.9 (2.9, 2.9)	30.8	60.3	90.2
Oklahoma	11.3 (7.0, 18.1)	2.2 (2.2, 2.3)	26.5	59.9	84.6
South Carolina	10.2 (5.9, 17.5)	2.8 (2.7, 2.8)	29.2	61.6	72.7
Tennessee	10.2 (7.5, 13.8)	4.6 (4.5, 4.6)	41.0	67.7	83.3
Texas	6.6 (5.1, 8.5)	2.2 (2.2, 2.2)	26.8	62.3	87.9
Virginia	6.5 (3.6, 11.7)	2.7 (2.6, 2.7)	30.7	57.3	95.0
West Virginia	12.9 (9.6, 17.3)	7.0 (6.9, 7.2)	41.4	57.1	100

Continued

RESEARCH AND PRACTICE

TABLE 2—Continued

State	Rate of Past-Year Opioid Abuse or Dependence	Rate of OA-MAT Capacity	Rate of Opioid Treatment Programs (OTPs)	OTPs per 1000 Population	OTPs per 1000 Population (2012)
West region					
Alaska	6.5 (3.9, 10.7)	6.2 (6.0, 6.4)	18.2	51.1	100.0
Arizona	12.0 (7.6, 18.8)	3.4 (3.4, 3.5)	21.1	48.3	69.2
California	7.6 (5.9, 9.6)	3.4 (3.4, 3.4)	19.4	52.9	70.8
Colorado	4.0 (2.9, 5.6)	3.2 (3.1, 3.2)	26.4	45.8	78.6
Hawaii	4.1 (2.5, 6.7)	3.8 (3.7, 3.9)	21.0	54.0	100.0
Idaho	10.0 (6.9, 14.5)	2.0 (1.9, 2.1)	32.0	58.0	0.0
Montana	7.2 (4.8, 10.7)	2.6 (2.5, 2.8)	32.6	51.2	100.0
Nevada	11.1 (8.0, 15.4)	3.5 (3.4, 3.6)	28.4	56.2	50.0
New Mexico	7.2 (4.9, 10.5)	7.1 (7.0, 7.2)	17.9	52.4	77.8
Oregon	12.8 (8.5, 19.2)	3.7 (3.7, 3.8)	19.8	36.8	75.0
Utah	9.5 (6.4, 14.2)	6.3 (6.2, 6.4)	31.0	47.1	45.5
Washington	11.0 (7.3, 16.6)	4.1 (4.1, 4.2)	21.3	39.0	84.2
Wyoming	6.2 (3.6, 10.7)	3.0 (2.8, 3.1)	17.6	64.7	No OTPs

Note. CI = confidence interval; DATA = Drug Addiction Treatment Act of 2000; OTP = opioid treatment program. Rates are per 1000 population aged ≥ 12 years. Source. Data are from the National Survey on Drug Use and Health, the National Survey of Substance Abuse Treatment Services, and the SAMHSA DATA 2000 Waiver Program. ^aRate of past-year opioid abuse or dependence represents average annual rate for 2009–2012 calculated by the Substance Abuse and Mental Health Services Administration's Center for Behavioral Health Statistics and Quality using a restricted-use National Survey on Drug Use and Health data file.

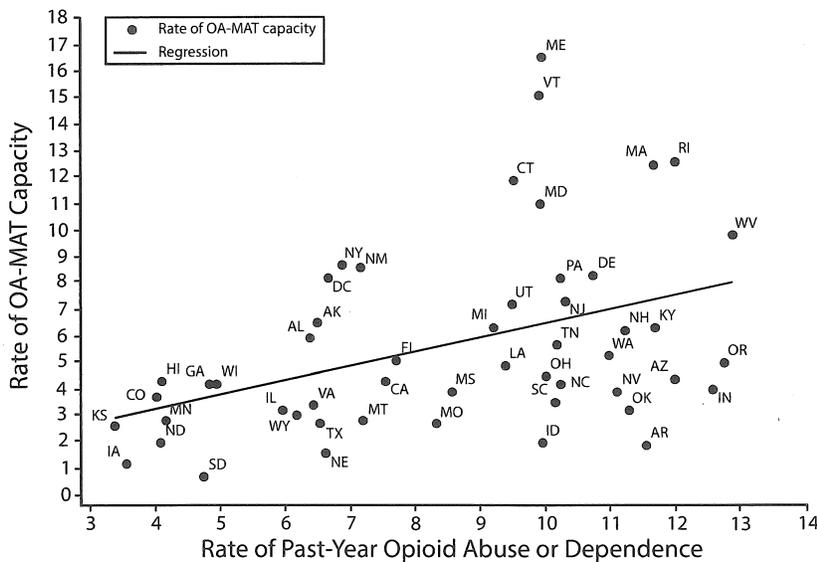
can make existing trained professionals more accessible to those in underserved or isolated communities.^{56–58}

Raising the limit on the number of patients who can be treated with buprenorphine by an individual provider and expanding the types of providers (e.g., nurse practitioners or

physician assistants) who can prescribe buprenorphine under DATA 2000 are additional policy options to consider. These potential changes should be undertaken in a thoughtful, data-driven, and planned fashion that incorporates feedback from all stakeholders.

As shown in this study, the number of OTPs remained relatively stable between 2003 and 2012. An increase in the number of operating OTPs would also help address treatment gaps. OTPs are an important part of the OA-MAT armamentarium because they offer onsite medical care required for those receiving methadone. Furthermore, DATA 2000 does not impose patient limits for buprenorphine use within OTPs, although state requirements may do so. Buprenorphine uptake in OTPs has been limited.⁵⁹ Despite strong evidence of public health benefit, there has been longstanding discrimination against OTPs, and the perception of a large regulatory burden in providing OA-MAT through OTPs remains. In addition, OTP capacity is often dictated by a variety of state and local requirements. These challenges, which have limited the reach of OTPs, suggest that applicable federal, state, and local regulations need to be reexamined to maximize OA-MAT in OTPs.

Use of oral or long-acting injectable formulations of the opioid antagonist naltrexone presents an additional opportunity to expand MAT for opioid use disorders. Unlike with methadone or buprenorphine, there are no federal requirements or restrictions on the type of clinician who can prescribe naltrexone. To date, use of naltrexone has been minimal compared with methadone or buprenorphine.⁶⁰



Note. OA-MAT = opioid agonist medication-assisted treatment.

FIGURE 2—Comparison of state rates of past-year opioid abuse or dependence and capacity for opioid agonist medication-assisted treatment: United States, 2012.

RESEARCH AND PRACTICE

The finding of significant state variation in rates of opioid abuse or dependence in this study is consistent with previous studies that have shown wide variation among state rates of drug overdose deaths, patients receiving opioids from multiple providers, and nonmedical use of opioids.^{5,61} Previous research has indicated that this variation is closely tied to state opioid supply and prescribing habits.^{5,61,62} Therefore, concerted efforts to expand access to OA-MAT in conjunction with policies that target the underlying drivers of the problem— inappropriate OPR prescribing and use—are essential for a long-term solution. Several strategies have shown promise for reducing inappropriate prescribing and use, such as implementation of OPR prescribing guidelines and education programs; development of real-time, interoperable state prescription drug monitoring programs; development of innovative insurer strategies; and implementation of laws, regulations, or policies that better monitor and regulate providers who might be indiscriminately prescribing opioids.¹

Limitations

This study has several limitations. First, NSDUH data are self-reported, and their value depends on the truthfulness and accuracy of individual respondents; under- or overreporting may occur. Second, NSDUH only captures noninstitutionalized civilians; populations such as homeless and incarcerated people and those in residential treatment are excluded. Therefore, our estimates may not generalize to the total US population and may exclude populations that include additional high-risk patients who would likely be candidates for OA-MAT. Thus, the true gap between treatment need and capacity is likely greater than that presented in our study.

Third, our definition of treatment need included both past-year opioid abuse and dependence. It is possible that some of the individuals with past-year opioid abuse would not be candidates for OA-MAT. Fourth, N-SSATS attempts to obtain responses from all known treatment facilities, but responding is voluntary. Although annual response rates were more than 90%, there was no adjustment for nonresponding facilities. Fifth, N-SSATS is a point-prevalence survey. Counts reported do not represent annual totals; rather, they

represent a snapshot of facilities and patients on an average day in the past year. N-SSATS is based on facility self-report; therefore, counts rely on the accuracy of the reporter.

Sixth, we did not have information on the actual number of patients prescribed buprenorphine by DATA-waived providers; our calculations were designed to represent the maximum number of patients who could be treated to enable an assessment of potential treatment capacity. Therefore, the difference between treatment need and capacity likely represents an underestimate of the actual gap at the national and state levels. Seventh, the opioid antagonist naltrexone is an alternative to OA-MAT that can help address the current treatment capacity gap. Data on the number of patients receiving naltrexone were not available for this study. Thus, we may have overestimated the actual treatment gap. However, this overestimation is likely very small given that naltrexone uptake among treatment programs to date has been minimal.⁶⁰

Finally, not all patients who are candidates for OA-MAT will choose this treatment option and may instead pursue drug-free treatment. Consequently, our findings may overestimate the OA-MAT treatment gap. Nevertheless, the evidence overwhelmingly supports OA-MAT as the most effective treatment for opioid addiction. The World Health Organization guideline for people with opioid dependence states that most patients should be advised to use opioid agonist maintenance treatment.¹² Thus, our estimates, which represent the maximum potential capacity for OA-MAT, show that the currently available OA-MAT resources are substantially inadequate to meet guideline-concordant care.

Conclusions

OA-MAT capacity increased in the past decade in the United States, however, a significant gap between treatment need and capacity remains. This is particularly acute in some of the states with the greatest need for opioid addiction treatment. Strategies to expand the addiction professionals workforce and to increase the existing pool of OA-MAT providers are needed. These actions, when taken in concert with broader policy and practice efforts, will address the underlying drivers of this public health crisis. ■

About the Authors

Christopher M. Jones is with the Office of Public Health Strategy and Analysis, Office of the Commissioner, Food and Drug Administration, Silver Spring, MD. Melinda Campopiano is with the Division of Pharmacologic Therapies, Center for Substance Abuse Treatment, Substance Abuse and Mental Health Services Administration, Rockville, MD. Grant Baldwin is with the Division of Unintentional Injury Prevention, National Center for Injury Prevention and Control, Centers for Disease Control and Prevention, Atlanta, GA. Elinore McCance-Katz is with the Office of Policy, Planning, and Innovation, Substance Abuse and Mental Health Services Administration.

Correspondence should be sent to Christopher M. Jones, PharmD, MPH, Office of Public Health Strategy and Analysis, Office of the Commissioner, Food and Drug Administration, 10903 New Hampshire Avenue, Silver Spring, MD 20993 (e-mail: christopher.m.jones@fda.hhs.gov). Reprints can be ordered at <http://www.ajph.org> by clicking the "Reprints" link.

This article was accepted March 2, 2015.

Note. The conclusions in this report are those of the authors and do not necessarily represent the official position of the Food and Drug Administration, the Substance Abuse and Mental Health Services Administration, or the Centers for Disease Control and Prevention.

Contributors

C. M. Jones conceptualized the article, was responsible for the data analyses, and was the lead writer. M. Campopiano, G. Baldwin, and E. McCance-Katz conceptualized the article, contributed specific content, and drafted revisions of the article.

Acknowledgments

We thank Pradip Muhuri, PhD, and Art Hughes, MS, with the Substance Abuse and Mental Health Services Administration's Center for Behavioral Health Statistics and Quality for supplying the special tabulation of state-level estimates of past-year opioid abuse or dependence. We also thank Jinhee Lee, PharmD, with the Substance Abuse and Mental Health Services Administration's Center for Substance Abuse Treatment for facilitating access to the DATA 2000 program information.

Human Participant Protection

Human participant protection was not required because the study was a secondary analysis of de-identified data.

References

1. US Department of Health and Human Services. Addressing prescription drug abuse in the United States: current activities and future opportunities. Available at: http://www.cdc.gov/homeandrecrreationalafety/overdose/hhs_rx_abuse.html. Accessed December 8, 2014.
2. Johnson EM, Lanier WA, Merrill RM, et al. Unintentional prescription opioid-related overdose deaths: description of decedents by next of kin or best contact, Utah, 2008–2009. *J Gen Intern Med*. 2013;28(4):522–529.
3. Hall AJ, Logan JE, Toblin RL, et al. Patterns of abuse among unintentional pharmaceutical overdose fatalities. *JAMA*. 2008;300(22):2613–2620.
4. Bohnert AS, Valenstein M, Bair MJ, et al. Association between opioid prescribing patterns and opioid overdose-related deaths. *JAMA*. 2011;305(13):1315–1321.

RESEARCH AND PRACTICE

5. Centers for Disease Control and Prevention. Vital signs: overdoses of prescription opioid pain relievers—United States, 1999–2008. *MMWR Morb Mortal Wkly Rep.* 2011;60(43):1487–1492.
6. Jones CM. Heroin use and heroin use risk behaviors among nonmedical users of prescription opioid pain relievers—United States, 2002–2004 and 2008–2010. *Drug Alcohol Depend.* 2013;132(1–2):95–100.
7. Substance Abuse and Mental Health Services Administration. Associations of nonmedical pain reliever use and initiation of heroin use in the United States. Available at: <http://samhsa.gov/data/2k13/DataReview/DR006/nonmedical-pain-reliever-use-2013.htm>. Accessed December 8, 2014.
8. Cicero TJ, Ellis MS, Surratt HL, Kurtz SP. The changing face of heroin use in the United States: a retrospective analysis of the past 50 years. *JAMA Psychiatry.* 2014;71(7):821–826.
9. Warner M, Hedegaard H, Chen L. Trends in drug-poisoning deaths involving opioid analgesics and heroin: United States, 1999–2012. 2014. Available at: http://www.cdc.gov/nchs/data/hestat/drug_poisoning/drug_poisoning.htm. Accessed December 19, 2014.
10. Klevens RM, Hu DJ, Jiles R, Holmberg SD. Evolving epidemiology of hepatitis C virus in the United States. *Clin Infect Dis.* 2012;55(suppl 1):S3–S9.
11. Zibbell JE, Hart-Malloy R, Barry J, Fan L, Flanagan C. Risk factors for HCV infection among young adults in rural New York who inject prescription opioid analgesics. *Am J Public Health.* 2014;104(11):2226–2232.
12. World Health Organization. Guidelines for the psychosocially assisted pharmacological treatment of opioid dependence. Available at: <http://apps.who.int/iris/handle/10665/43948>. Accessed December 10, 2014.
13. Kresina TF, Lubran R. Improving public health through access to and utilization of medication assisted treatment. *Int J Environ Res Public Health.* 2011;8(10):4102–4117.
14. Kraus ML, Alford DP, Kotz MM, et al. Statement of the American Society of Addiction Medicine consensus panel on the use of buprenorphine in office-based treatment of opioid addiction. *J Addict Med.* 2011;5(4):254–263.
15. Bonhomme J, Shim RS, Gooden R, Tyus D, Rust G. Opioid addiction and abuse in primary care practice: a comparison of methadone and buprenorphine as treatment options. *J Natl Med Assoc.* 2012;104(7–8):342–350.
16. Bart G. Maintenance medication for opiate addiction: the foundation of recovery. *J Addict Dis.* 2012;31(3):207–225.
17. Schwartz RP, Gryczynski J, O'Grady KE, et al. Opioid agonist treatments and heroin overdose deaths in Baltimore, Maryland, 1995–2009. *Am J Public Health.* 2013;103(5):917–922.
18. Carrieri MP, Amass L, Lucas GM, Vlahov D, Wodak A, Woody GE. Buprenorphine use: the international experience. *Clin Infect Dis.* 2006;43(suppl 4):S197–S215.
19. Clark RE, Samnaliev M, Baxter JD, Leung GY. The evidence doesn't justify steps by state Medicaid programs to restrict opioid addiction treatment with buprenorphine. *Health Aff (Millwood).* 2011;30(8):1425–1433.
20. Tsui JJ, Evans JL, Lum PJ, Hahn JA, Page K. Association of opioid agonist therapy with lower incidence of hepatitis C virus infection in young adult injection drug users. *JAMA Intern Med.* 2014;174(12):1974–1981.
21. Gryczynski J, Schwartz RP, Salkever DS, Mitchel SG, Jaffe JH. Patterns in admission delays to outpatient methadone treatment in the United States. *J Subst Abuse Treat.* 2011;41(4):431–439.
22. Andrews CM, Shin HC, Marsh JC, Cao D. Client and program characteristics associated with wait time to substance abuse treatment entry. *Am J Drug Alcohol Abuse.* 2013;39(1):61–68.
23. Rosenblum A, Cleland CM, Fong C, Kayman DJ, Tempalski B, Parrino M. Distance traveled and cross-state commuting to opioid treatment programs in the United States. *J Environ Public Health.* 2011;2011:948789.
24. Sigmon SC. Access to treatment for opioid dependence in rural America: challenges and future directions. *JAMA Psychiatry.* 2014;71(4):359–360.
25. Drug Addiction Treatment Act of 2000, Pub. L. No. 106-310, 114 Stat. 1101. Available at: <http://www.gpo.gov/fdsys/pkg/PLAW-106publ310/pdf/PLAW-106publ310.pdf>. Accessed November 11, 2014.
26. Greenfield BL, Owens MD, Ley D. Opioid use in Albuquerque, New Mexico: a needs assessment of recent changes and treatment availability. *Addict Sci Clin Pract.* 2014;9:10.
27. Volkow ND, Frieden TR, Hyde PS, Cha SS. Medication-assisted therapies—tackling the opioid-overdose epidemic. *N Engl J Med.* 2014;370(22):2063–2066.
28. Sohler NL, Weiss L, Egan JE, et al. Consumer attitudes about opioid addiction treatment: a focus group study in New York City. *J Opioid Manag.* 2013;9(2):111–119.
29. American Society of Addiction Medicine. State Medicaid coverage and authorization requirements for opioid dependence medications. 2013. Available at: <http://www.asam.org/docs/advocacy/Implications-for-Opioid-Addiction-Treatment>. Accessed December 10, 2014.
30. Roman PM, Abraham AJ, Knudsen HK. Using medication-assisted treatment for substance use disorders: evidence of barriers and facilitators of implementation. *Addict Behav.* 2011;36(6):584–589.
31. Cunningham CO, Kunins HV, Roose RJ, Elam RT, Sohler NL. Barriers to obtaining waivers to prescribe buprenorphine for opioid addiction treatment among HIV providers. *J Gen Intern Med.* 2007;22(9):1325–1329.
32. Walley AY, Alperen JK, Cheng DM, et al. Office-based management of opioid dependence with buprenorphine: clinical practices and barriers. *J Gen Intern Med.* 2008;23(9):1393–1398.
33. Kissin W, McLeod C, Sonnefeld J, Stanton A. Experiences of a national sample of qualified addiction specialists who have and have not prescribed buprenorphine for opioid dependence. *J Addict Dis.* 2006;25(4):91–103.
34. Cunningham CO, Sohler NL, McCoy K, Kunins HV. Attending physicians' and residents' attitudes and beliefs about prescribing buprenorphine at an urban teaching hospital. *Fam Med.* 2006;38(5):336–340.
35. Hutchinson E, Catlin M, Andrilla CHA, Baldwin LM, Rosenblatt RA. Barriers to primary care physicians prescribing buprenorphine. *Ann Fam Med.* 2014;12(2):128–133.
36. Netherland J, Botsko M, Egan JE, et al. Factors affecting willingness to provide buprenorphine treatment. *J Subst Abuse Treat.* 2009;36(3):244–251.
37. Kunins HV, Sohler NL, Giovanniello A, Thompson D, Cunningham CO. A buprenorphine education and training program for primary care residents: implementation and evaluation. *Subst Abuse.* 2013;34(3):242–247.
38. McCarty D, Rieckmann T, Green C, Gallon S, Knudsen J. Training rural practitioners to use buprenorphine: using *The Change Book* to facilitate technology transfer. *J Subst Abuse Treat.* 2004;26:203–208.
39. Daniels AM, Salisbury-Alfhar E, Hoffberg A, Agus D, Fingerhood MI. A novel community-based buprenorphine program: client description and initial outcomes. *J Addict Med.* 2014;8(1):40–46.
40. Stein BD, Gordon AJ, Dick AW, et al. Supply of buprenorphine waived physicians: the influence of state policies. *J Subst Abuse Treat.* 2015;48(1):104–111.
41. *Results From the 2012 National Survey on Drug Use and Health: Summary of National Findings.* NSDUH Series H-46, HHS Publication No. (SMA) 13-4795. Rockville, MD: Substance Abuse and Mental Health Services Administration; 2013.
42. US Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, Center for Behavioral Health Statistics and Quality. *National Survey on Drug Use and Health, 2003-2012 (ICPSR 34933-v1).* Ann Arbor, MI: Inter-University Consortium for Political and Social Research; 2013.
43. US Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, Center for Behavioral Health Statistics and Quality. *National Survey on Drug Use and Health, 2009-2012.* Restricted Use Data Files. Rockville, MD: Substance Abuse and Mental Health Services Administration; 2014.
44. US Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, Center for Behavioral Health Statistics and Quality. *National Survey of Substance Abuse Treatment Services (N-SSATS), 2003-2012 (ICPSR 34968).* Ann Arbor, MI: Inter-University Consortium for Political and Social Research; 2014.
45. Substance Abuse and Mental Health Services Administration. Buprenorphine Physician and Treatment Program Locator. Available at: http://buprenorphine.samhsa.gov/bwns_locator/index.html. Accessed November 18, 2014.
46. American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders.* 4th ed. Washington, DC: American Psychiatric Association; 1994.
47. US Census Bureau, Population Division. Population estimates. Available at: <http://www.census.gov/popest/index.html>. Accessed November 18, 2014.
48. Arfken CL, Johanson CE, Menza SD, Schuster CR. Expanding treatment capacity for opioid dependence with office-based treatment with buprenorphine: national surveys of physicians. *J Subst Abuse Treat.* 2010;39(2):96–104.
49. Ducharme LJ, Abraham AJ. State policy influence on the early diffusion of buprenorphine in community treatment programs. *Subst Abuse Treat Prev Policy.* 2008;3:17.
50. Heinrich CJ, Cumming GR. Adoption and diffusion of evidence-based addiction medications in substance abuse treatment. *Health Serv Res.* 2014;49(1):127–152.

51. Vermont Agency of Human Services. Integrated treatment for substance use dependence: "Hub/Spoke" Initiative—phase 1: opiate dependence. Available at: <http://www.healthvermont.gov/adap/documents/HUBSPOKEBriefingDocV122112.pdf>. Accessed December 11, 2014.
52. Centers for Medicare and Medicaid Services. Informational bulletin: medication assisted treatment for substance use disorder. Available at: <http://www.medicare.gov/Federal-Policy-Guidance/Downloads/CIB-07-11-2014.pdf>. Accessed December 11, 2014.
53. Patient Protection and Affordable Care Act, Pub. L. No. 111-148, 42 U.S.C. §§ 18001-18121 (2010).
54. White WL. Medication-assisted recovery from opioid addiction: historical and contemporary perspectives. *J Addict Dis.* 2012;31(3):199-206.
55. Egan JE, Casadonte P, Gartenmann T, et al. The Physician Clinical Support System-Buprenorphine (PCSS-B): a novel project to expand/improve buprenorphine treatment. *J Gen Intern Med.* 2010;25(9):936-941.
56. Scott JD, Unruh KT, Catlin MC, et al. Project ECHO: a model for complex, chronic care in the Pacific Northwest region of the United States. *J Telemed Telecare.* 2012;18(8):481-484.
57. Hall G, Neighbors CJ, Iheoma J, et al. Mobile opioid agonist treatment and public funding expands treatment for disenfranchised opioid-dependent individuals. *J Subst Abuse Treat.* 2014;46(4):511-515.
58. King VL, Brooner RK, Peirce JM, Kolodner K, Kidorf MS. A randomized trial of Web-based videoconferencing for substance abuse counseling. *J Subst Abuse Treat.* 2014;46(1):36-42.
59. *2011 Opioid Treatment Program Survey: Data on Substance Abuse Treatment Facilities With OTPs.* Rockville, MD: Substance Abuse and Mental Health Services Administration; 2013. BHSIS Series S-65, HHS Publication No. (SMA) 14-4807.
60. Aletraris L, Bond Edmond M, Roman PM. Adoption of injectable naltrexone in US substance use disorder treatment programs. *J Stud Alcohol Drugs.* 2015;76(1):143-151.
61. McDonald DC, Carlson KE. The ecology of prescription opioid abuse in the USA: geographic variation in patients' use of multiple prescribers ("doctor shopping"). *Pharmacoepidemiol Drug Saf.* 2014;23(12):1258-1267.
62. Dasgupta N, Kramer ED, Zalman MA, et al. Association between non-medical and prescriptive usage of opioids. *Drug Alcohol Depend.* 2006;82(2):135-142.



NIH Public Access

Author Manuscript

Published in final edited form as:

J Addict Med. 2014 ; 8(5): 315–326. doi:10.1097/ADM.0000000000000045.

A Review of Buprenorphine Diversion and Misuse: The Current Evidence Base and Experiences from Around the World

Michelle R. Lofwall, MD^{a,*} and Sharon L. Walsh, Ph.D.^b

^a University of Kentucky College of Medicine, Associate Professor, Departments of Behavioral Science and Psychiatry, Center on Drug and Alcohol Research, 515 Oldham Court, Lexington, KY 40502

^b University of Kentucky College of Medicine, Professor, Departments of Behavioral Science, Psychiatry and Pharmacology, College of Pharmacy, Department of Pharmaceutical Sciences, Director of Center on Drug and Alcohol Research, 515 Oldham Court, Lexington, KY 40502. Tel: (859) 257-6485; sharon.walsh@uky.edu

Abstract

Outpatient opioid addiction treatment with sublingual buprenorphine pharmacotherapy (OBOT) has rapidly expanded in the United States and abroad, and, with this increase in medication availability, there have been increasing concerns about its diversion, misuse and related harms. This narrative review defines the behaviors of diversion and misuse, examines how the pharmacology of buprenorphine alone and in combination with naloxone influence its abuse liability, and describes the epidemiological data on buprenorphine diversion and intravenous misuse, risk factors for its intravenous misuse and the unintended consequences of misuse and diversion. Physician practices to prevent, screen for, and therapeutically respond to these behaviors, which are a form of medication non-adherence, are discussed and gaps in knowledge are identified. OBOT experiences from other countries that have varied health care systems, public policies, and access to addiction treatment are shared in order to make clear that diversion and misuse occur across the world in various contexts, for many different reasons, and are not limited to buprenorphine. Comparisons are made with other opioids with known abuse liability as well as medications with no known abuse. The objective is to facilitate understanding of diversion and misuse so that all factors influencing their expression (patient and provider characteristics and public policy) can be appreciated within a framework that also recognizes the benefits of addiction treatment. With this comprehensive perspective, further careful work can help determine how to minimize these behaviors without eroding the current benefits realized through improved addiction treatment access and expansion.

Keywords

buprenorphine; misuse; diversion; treatment; epidemiology; behavioral pharmacology

*Corresponding author: michelle.lofwall@uky.edu.

Introduction

Outpatient opioid addiction treatment with sublingual buprenorphine formulations (OBOT) has expanded rapidly over the last two decades in many areas of the world. Notably, before its use in addiction treatment, sublingual (e.g., Temgesic®) and injectable buprenorphine (e.g., Buprenex®) formulations were approved for pain treatment, and multiple countries reported problems with their misuse and diversion (Morrison, 1989; Singh, Mattoo, Malhotra, & Varma, 1992). OBOT became available in the United States (U.S.) later, after the passage of the Drug Abuse Treatment Act of 2000; this law allowed schedule IIIIV opioids approved by the Food and Drug Administration (FDA) for the treatment of opioid dependence to be prescribed by medical practitioners outside of the confines of federally licensed methadone treatment centers for the first time since the passage of the Harrison Narcotic Act in 1914. Subsequently, the FDA approved both buprenorphine (BUP) and buprenorphine/naloxone combination (BUP/NX) sublingual tablet formulations. However, many European countries, Australia, and some Asian countries had introduced BUP earlier (throughout the 1990's) and BUP/NX followed in some countries (e.g., in 2006 BUP/NX was approved for use in the European Union). Generic tablet formulations have now also entered various markets, and a BUP/NX film product is now available in the U.S. and Australia.

With the growth of OBOT treatment and resulting increased availability of buprenorphine, concerns related to buprenorphine misuse and diversion have arisen (Center for Substance Abuse Research 2011; Johanson et al., 2012), the extent of which has varied widely across countries. This paper will review available published evidence regarding what is known about buprenorphine product misuse, diversion, and the unintended consequences of these behaviors for patients, providers and societies. These behaviors are influenced by an array of variables, including the pharmacological properties of the different medication formulations, patient and health care provider attitudes and behaviors, treatment structures, social and cultural expectations and public policy. It will describe mitigation strategies that can deter misuse and diversion. Understanding the broader international experience, where both access to treatment and the structure of OBOT services differ considerably, along with the current situation in the U.S. may inform strategies for responding to diversion and misuse in the U.S.

Definitions

For the purpose of this review and associated case conference, *BUP* specifically refers to the monotherapy sublingual tablet, *BUP/NX* to the combination tablet or film (buprenorphine with naloxone), and *buprenorphine* refers to both BUP and BUP/NX. *Diversion* is defined as the unauthorized rerouting or misappropriation of prescription medication to someone other than for whom it was intended. Diversion can occur either voluntarily or involuntarily and either with or without the exchange of money or other services (Larance et al., 2011b). *Misuse* includes taking medication in a manner, by route or by dose, other than prescribed. For instance, injecting, snorting or smoking medication intended for oral use or double or tripling doses are both examples of misuse. Notably, these definitions do not discuss

underlying motives, relatedness to addiction, treatment structure or access, or appropriate clinical responses.

Buprenorphine Formulations and Their Pharmacology

The primary pharmacological activity of buprenorphine in the treatment of opioid dependence arises from its partial agonist activity at the mu opioid receptor; however, it is also an antagonist at the kappa opioid receptor and a partial agonist at the nociceptin or NOP recep (Bloms-Funke et al., 2000; Cowan and Lewis, 1995). As a *mu* opioid partial agonist, buprenorphine does not exert the same degree of intrinsic activity as a full *mu* opioid agonist, such as methadone, heroin or oxycodone. This limit on effects at the upper end of the dose response curve is the mechanism underlying the superior safety profile of buprenorphine compared to full *mu* opioid agonists with respect to respiratory depression and fatal overdose. This partial agonist profile has led some to suggest that buprenorphine would have reduced abuse liability compared to full *mu* agonists, but it must be recognized that buprenorphine can produce acute effects equivalent to a 60-mg dose of methadone (Walsh et al., 1994) and, thus, in individuals without physical dependence, buprenorphine is appealing for misuse and diversion. However, buprenorphine can also lead to precipitated withdrawal in opioid-dependent individuals because its high affinity/high *mu* opioid receptor occupancy, coupled with its partial agonist effects, allows it to displace other opioids occupying the receptor, while exerting insufficient activity to replace the displaced opioid's full agonist action (e.g., Walsh et al., 1995). This may occur under some dosing conditions but not others (e.g., Rosado et al., 2007; Strain et al., 1992) and appears to be dependent upon the maintenance opioid, the degree of physical dependence (i.e., maintenance dose), the time since last dose and the dose of buprenorphine. Precipitated withdrawal from buprenorphine can also be largely avoided by dosing only after a patient is experiencing some withdrawal (i.e., when some portion of receptors are already unoccupied and agonist effects are not present).

BUP/NX was developed as an abuse-deterrent formulation. Inclusion of naloxone (which typically has very low or no sublingual bioavailability and, thus, is essentially inert when taken by the proper route) would lead to precipitated withdrawal in an opioid dependent individual when the medication is misused by injection [and naloxone is bioavailable] (Mendelson et al., 1999; Stoller et al., 2001). Moreover, recent data have reported that intranasal administration of the BUP/NX tablets after crushing also delivers clinically relevant concentrations of naloxone (Middleton et al., 2011) that could, under some conditions, lead to precipitated withdrawal. However, more generally, the effects of naloxone are short-lived due its short half-life (~ 60 min), and the naloxone/buprenorphine dose ratio of (1:4) is not high enough to fully block the agonist effects of buprenorphine. Numerous case reports and studies have demonstrated that there are strategies (e.g., administering very small divided doses of BUP/NX), which can be employed to circumvent the precipitation of withdrawal after injection of BUP/NX by opioid dependent individuals (e.g., Larance et al., 2011a; Rosado et al., 2007). Thus, the abuse-deterrent feature of naloxone in the combination product is only relevant (and a deterrent) under a subset of conditions. While the combination formulation is the recommended formulation for providers to prescribe, research volunteers in laboratory and epidemiological studies have

generally reported that when both BUP and BUP/NX are available, they prefer BUP over BUP/NX, and when full mu-opioid agonists are available, the full agonists are preferred over both buprenorphine formulations (Alho et al., 2007; Comer et al., 2010; Degenhardt et al., 2009; Strain et al., 2000; Vicknasingam et al., 2010).

Epidemiology of Buprenorphine Diversion and Misuse

Buprenorphine Diversion

Numerous factors contribute to whether a particular drug is diverted for illicit use by individuals without a legitimate prescription, including, for example, drug availability, price, pharmacologic properties, psychosocial and environmental factors (e.g., established distribution systems and social networks) and, in the case of opioids, the degree to which dosing is supervised and the extent to which treatment demand is met (e.g., see review by Bell, 2010). However, it is important to recognize that drug diversion (including sharing or selling a prescribed drug) may be a relatively common behavior; one that is not limited to those with drug dependence disorders. For example, data from the U.S. National Household Survey on Drug Use and Health reported that nearly 17 million persons used a prescription psychotherapeutic drug that had not been prescribed to them in the past year (SAMHSA, 2013). In a smaller national survey, 23% of those queried admitted that they shared their prescription drugs with others, while 27% of the sample reported that they had borrowed prescription medication from another person (Goldsworthy et al., 2008). The most commonly shared drug classes were allergy medications (25%), pain relievers (22%) and antibiotics (21%). Similar to these community dwelling sample surveys (i.e., having a substance use disorder was not required for inclusion), surveys of patients enrolled in outpatient opioid agonist programs (methadone or buprenorphine) across distinct geographical regions with widely varying treatment structures report that 18-28% have sold, given away their medication, removed it while under supervision, or shared other prescribed medication [Germany 23% (Stover, 2011); Australia 28% (Larance et al., 2011a); U.S., 18% (Caviness et al., 2013)]. Thus, sharing and receiving prescribed medications (i.e., diversion) is not unique to those with drug dependence disorders and a variety of medication, not only those with abuse liability, is diverted.

With regard to availability, the rapid growth and penetration of buprenorphine in the addiction medicine marketplace has increased its availability considerably over a relatively short time period. In the U.S., for example, the Automation of Reports and Consolidated Orders System (ARCOS), which monitors the flow of specific controlled substances from manufacture to distribution at the retail level, reports that over 190 million dosage units of buprenorphine were distributed to pharmacies in 2010, which is over four-fold higher than the almost 40 million dosage units distributed just four years prior in 2006 (DHHS, 2012). Notably, only 1.1 million dosage units were distributed to licensed opioid treatment programs during 2010. Almost 800,000 individuals received prescriptions for buprenorphine from physicians with a waiver (also known as an X-license because of the marking on the DEA prescriber's license) to provide OBOT under DATA 2000 in 2010, representing a nearly five-fold increase from the 150,000 individuals estimated in 2006 (DHHS, 2012).

Thus, the opportunity to misuse and divert buprenorphine has grown rapidly during this great expansion of OBOT.

There are limited data available that address the specific source of diverted buprenorphine. Larance and colleagues reported on a cohort of out-of-treatment intravenous drug users (IVDU) in Australia who had received diverted buprenorphine. The majority reported receiving it from friends (81% BUP and 63% BUP/NX), while acquaintances (19% BUP and 25% BUP/NX) and dealers (19%) were reported less frequently. In this cohort, half of those receiving diverted BUP believed that it was someone's take-home dose and the majority (71%) had paid for the drug. Interestingly, for BUP/NX, 70% believed that the dose they received was a take-home dose but fewer than half paid for it and 48% stated that they had received the drug for free. Additionally, while 12% and 9% of all BPN and BUP/NX doses dispensed, respectively, were reported as being secretly removed from the mouth during supervised dosing for later use, only a small percentage of these (9% and 13%) were removed for the purpose of selling the drug (Larance et al., 2011a).

Intravenous Misuse By Patients and Out-of-Treatment Opioid Users

Intravenous misuse will be reviewed primarily because of the significant risks associated with IVDU, including spread of infectious diseases (e.g., hepatitis C, HIV), other medical complications (e.g., abscess, endocarditis), and overdose. Intravenous injection of BUP and BUP/NX has been reported around the world by individuals both in and out of treatment. In a survey of individuals presenting for prescription opioid abuse treatment in the U.S. between 2005-2007 (n=1000), 6% of participants reported injecting buprenorphine "to get high", while 37% of participants reported injection of other prescription opioids (e.g., oxycodone) for this reason (Cicero et al., 2007). While that study did not distinguish between BUP and BUP/NX, another surveillance system, RADARS® (Researched Abuse Diversion Addiction Related Surveillance) reported past month prevalence in the U.S. of IV BUP and BUP/NX misuse of 45.5% and 16.3%, respectively, by individuals presenting for opioid abuse treatment (Dart, 2011). Lower prevalence of injection of BUP/NX compared to BUP has also been reported in other countries. In Australia, liquid methadone, BUP, and BUP/NX are all available treatments, and all require a period of initial supervised dosing. Among patients receiving any of these medications as part of OBOT, weekly medication injection was significantly lower for BUP/NX (7%) compared to BUP (13%), but similar to liquid methadone (8%) (Degenhardt et al., 2009).

More recent data from France, where generic formulations have been available since 2006, reported significant differences in prevalence of injection of generic (5% of n=537) versus brand name BUP (10% of n=1159) among surveyed patients who were receiving OBOT through specialty addiction treatment clinics (i.e., not by general practitioners) (Nordmann et al., 2012). The reason for these differences was not evident, but the authors speculated that market penetration, patient preferences, familiarity with brand name, flavorings or other excipients, or even subtle differences in bioavailability could be contributing factors. Only one study to date has compared prevalence of frequent injection (at least weekly) of BUP/NX film to BUP/NX tablets (Larance et al., 2014). This Australian study was conducted in 2012 employing two distinct samples: 1) outof-treatment injection drug users

(n=541) and 2) patients in opioid addiction treatment with either buprenorphine or methadone pharmacotherapy (n=544). It showed no significant differences in either sample in the prevalence of frequent injection of BUP/NX films (out-of-treatment: 1%; patients: 3%) compared to BUP/NX tablets (out-of-treatment: 3%; patients: 9%). These percentages were similar to the prevalence of frequent methadone injection (4% among out-of-treatment persons; 3% among patients). Frequent injection of BUP was higher (out-of-treatment: 6%; 11% among patients) than for both BUP/NX formulations.

Reports of buprenorphine injection rates surpassing heroin, methadone or other full mu-opioid agonist analgesics are rare across the world. In the U.S., where there is ready availability of full agonist mu-opioid analgesics (i.e., those formulated for treatment of pain) and heroin, buprenorphine was infrequently described as the primary drug of abuse among individuals seeking prescription drug abuse treatment (<3%) (Cicero et al., 2007). However, this has not been the case in all countries, such as Finland and Malaysia, where far greater problems of regular buprenorphine injection emerged due to unique circumstances in both countries.

Finland developed significant problems with increasing numbers of daily intravenous buprenorphine users in the late 1990's when heroin availability was declining due to decreased supply from Afghanistan (NBI, 2003; Uosukainen et al., 2013c). Finnish authorities reported that the primary source of misused BUP was from outside its borders (Forsell et al., 2010). By 2001, BUP replaced heroin as the most commonly abused opioid among persons seeking addiction treatment (Uosukainen et al., 2013c). Averaged over the 11-year period from 1998-2008, 16% of those surveyed who were seeking *any* type of substance abuse treatment identified buprenorphine as their primary drug of abuse; 80% were using it intravenously and most also were misusing other prescription-type medications (Uosukainen et al., 2013c). Treatment for people who were abusing buprenorphine was primarily with lofexidine and withdrawal protocols, and mortality rates were high, similar to those with primary abuse of heroin (Uosukainen et al., 2013b). Because of the emergence of widespread IV BUP abuse, BUP was restricted for treatment during pregnancy only, and BUP/NX, introduced in 2006, became the more commonly prescribed formulation. Notably, BUP and BUP/NX treatment have stringent criteria for treatment entry that begins in specialty addiction treatment clinics where dosing is observed (Forsell et al., 2010; Uosukainen et al., 2013a).

To evaluate the impact of the introduction of BUP/NX in Finland on prevalence of injection of BUP, a survey queried out-of-treatment needle exchange participants in 2005 (n=176) and in 2010 (n=276) (Simojoki and Alho, 2013). Daily injection BUP misuse decreased from 81.7% in 2005 to 74.3% in 2010; however, BUP remained the most commonly abused drug by the intravenous route. Daily injection use of BUP/NX was reported to be 14.7% in 2010, over 5-fold lower than daily injection of BUP among these needle exchange participants. The majority (64%) of this sample in 2010 endorsed their desire to enter opioid maintenance treatment. Unfortunately, approximately 50% reported not being accepted for treatment. The study authors concluded, in part, that there was a need for more opioid maintenance treatment options in Finland.

In Malaysia, injection of BUP emerged shortly after its introduction in 2002 during a rapid OBOT expansion provided primarily by general practitioners who received no training or practice guidelines for OBOT (Vicknasingam et al., 2010). Moreover, providers received additional income if they dispensed the medication (rather than prescribed) and received higher payment for more medication dispensed. Reports of frequent prescribing and dispensing of weekly-to-monthly take-home supplies of medication ensued. In 2006, one survey reported that among 276 persons recruited with past weekly IV BUP use, 63% were injecting BUP daily, which was most commonly (i.e., 76% of reports) received from a private general practice clinic (Vicknasingam et al., 2010). BUP was removed from the Malaysian market in 2006 and replaced with BUP/NX in 2007. A mandatory 8-hour training was introduced and a national registry of patients receiving BUP/NX was created. Shortly after BUP/NX became available in 2007, a survey recruited 204 persons with lifetime BUP/NX IV use. Within this sample, 34% were injecting BUP/NX daily. The top reasons for injecting BUP/NX included: to treat addiction (81%); alleviate withdrawal (70%); less expensive than heroin (57%); and for pleasure (36%). The most common source again was private practice general practitioners (77%). The study authors recommended reducing the financial incentives to physicians for dispensing large quantities of BUP/NX (Vicknasingam et al., 2010).

Risk Factors for Intravenous Buprenorphine Misuse

The studies above show that intravenous use of BUP is more frequent than BUP/NX, and IV buprenorphine use can occur in any country - a reminder that no particular type of health care system or addiction treatment system is immune. The Finnish experience demonstrates that medications, just like illicit substances (e.g., heroin), can become available even if the source is not from within one's own country and suggests that having inadequate access and/or stringently controlled access to opioid maintenance treatment is a potential risk factor for continued diversion and misuse of a therapeutic agent with opioid agonist properties. Attempting, but failing, to enter OBOT also has been prospectively identified as a risk factor for use of diverted buprenorphine (route not evaluated) in the United States, specifically Appalachia, Kentucky (Lofwall and Havens, 2012), and many barriers to accessing OBOT have been recently documented by the American Society of Addiction Medicine across the U.S. (ASAM, 2013). The Malaysia experience, on the other hand, suggests that significant IV buprenorphine use can arise within the context of simply providing buprenorphine in substantial supply (i.e., 2 - 4 weeks) to persons with IV opioid addiction in a treatment setting with provider incentives misaligned with patient treatment needs (e.g., payment based upon amount of medication dispensed).

Multiple cross-sectional studies have surveyed BUP/NX injectors to explore the reasons underlying their injecting behavior. Reasons commonly (e.g., >75%) include self-treatment of withdrawal or addiction, but other reasons are offered, including use for euphoric/pleasurable effects (Alho et al., 2007; Bazazi et al., 2011; Moratti et al., 2010; Vicknasingam et al., 2010); notably, these are not mutually exclusive. Much attention has been given to misuse for reasons that mimic the medical reasons for which the medication is prescribed. These latter reasons should not be used to legitimize IV misuse of diverted medication because many persons addicted to illicit substances (e.g., heroin) will similarly

report use of heroin to prevent or treat their withdrawal/to feel “normal,” and there is clear morbidity and mortality associated with IVDU. There are no data showing that IV self-medication with buprenorphine is effective treatment. Rather, the high percentages of use of diverted medication for “self-treatment” may be a sentinel public health signal that treatment needs are not being met and that improved access to and/or expansion of treatment are essential.

The evidence base evaluating risk factors for intravenous use of buprenorphine among persons currently receiving buprenorphine treatment is scant with very few prospective studies. One cross-sectional study in France conducted 404 face-to-face confidential interviews with patients receiving treatment with BUP; only those who used BUP for the first time by physician prescription were eligible (Vidal-Trecau et al., 2003). Multivariable logistic regression demonstrated that having a history of IVDU was the most robust risk factor [Odds ratio (OR): 13.2], followed by current cannabis use (OR: 3.4) and having no salary (OR: 1.6). Ongoing heroin use during OBOT was protective (OR: 0.2), likely because injecting buprenorphine may precipitate withdrawal in regular heroin users, but more importantly, this result suggests that the patient could be trading or selling their medication in exchange for their primary opiate of choice, heroin. Another study from France prospectively evaluated patients in BUP treatment by telephone. The first phone survey was conducted after a minimum of three months in OBOT, and the second was conducted six months later (Roux et al., 2008). The response rate was 70% (n=111). Multivariate analysis adjusting for the time since first drug injection (a proxy of drug addiction severity) showed three significant risk factors for IV BUP use over the 6-month period: 1) perception of BUP dose as inadequate (OR: 2.7; median dose was 6 mg); 2) history of suicidal attempt or ideation (OR: 2.6); and 3) the number of years of IVDU (OR: 1.05). Injecting is a behavior that is highly conditioned; it is not surprising that such a behavior chronically repeated over time would continue for some time after treatment entry. However, it is not yet known what interventions may best extinguish injection behavior. This study also highlighted the role of appropriate dosing and comorbid conditions on IV risk and will be discussed in more detail in the recommended practices section.

Consequences of Buprenorphine Misuse and Diversion

Injection of any drug can cause a host of medical problems from local tissue site injury (e.g., tissue necrosis, abscess) to systemic infections such as endocarditis; these are also consequences that have been reported with buprenorphine injection (Gouny et al., 1999; Ho et al., 2009). Additionally, injection of pharmaceuticals intended for oral consumption may contain talc and other excipients that, when injected, can cause additional systemic complications, such as pulmonary granulomas (Waller et al., 1980). Reports of uncommon infections such as ocular candidiasis have occurred after removal of buprenorphine from the mouth (while under “supervision”) for later injection (Aboltins et al., 2005) and after injecting BUP that has been combined with contaminated solutions (Cassoux et al., 2002). There also have been case reports of severe liver pathology after parenteral use, sometimes involving other hepatotoxins and/or co-infection with hepatitis B and/or C (Berson et al., 2001; Herve et al., 2004).

The most worrisome patient and public health outcome to be associated with any medication is death. Deaths involving buprenorphine have been well described from France where BUP treatment rapidly grew from 1,000 patients in 1994 to 55,000 patients in 1998 (Auriacombe et al., 2001). OBOT is provided there primarily by general practitioners (Auriacombe et al., 2004) who can prescribe BUP to an unlimited number of patients and without any required training. A maximum of seven days of take-home doses is now recommended (Auriacombe et al., 2004), and while supervised dosing, urine drug testing and counseling are not required, French pharmacies can and do provide daily supervised dosing if the physician requests this service (Vignau et al., 2001). Surprisingly, buprenorphine maintenance doses were frequently co-prescribed (43%) with benzodiazepines (Thirion et al., 2002). Reports of deaths involving BUP followed; decedents frequently had positive toxicology tests for benzodiazepines and signs of injection drug use, suggesting that the concomitant use of benzodiazepines as well as parenteral administration were risk factors for death (Reynaud et al., 1998; Tracqui et al., 1998). Other countries have also reported buprenorphine-related deaths, most often in the context of concomitant use of benzodiazepines and/or alcohol highlighting the fact that combined use with non-benzodiazepine CNS depressants is also a risk factor for fatal overdose (Hakkinen et al., 2012; Selden et al., 2012). Death rates attributable to BUP were 3-fold less compared to methadone-related deaths in France over 1994-1998 when adjusted for the number of patients receiving each pharmacotherapy (Auriacombe et al., 2001). Importantly, the number of drug overdose deaths decreased by 79% in France from 1995 through 1999 while addiction treatment with BUP and methadone increased by over 95% and syringe exchange programs were developed (Auriacombe et al., 2004).

In the U.S., there are currently approximately 23,000 physicians with a waiver to provide OBOT (28% of those have a 100-patient limit; the remainder have a 30-patient limit; Drug Enforcement Agency National Technical Information Service, 2013). The number of deaths involving sublingual buprenorphine products (including generics) that are specifically approved by the Food and Drug Administration for the indication of opioid dependence treatment from 2002 to October of 2013 totaled 464 [email communication with Reckitt Benckiser Pharmaceuticals (RBP)]. These deaths exclude those involving injectable buprenorphine [i.e., Buprenex®; n=5 and non-specified buprenorphine products (n=53)]. Of the 464 deaths, there were 29 perinatal/neonatal deaths (e.g., miscarriage, stillbirth) whereby the mother was taking buprenorphine during pregnancy (not known if the mother was receiving buprenorphine as part of addiction treatment), six infant deaths, and 3 non-infant pediatric deaths; 423 deaths (91%) involved BUP/NX and 41 (9%) involved BUP. These results should not be interpreted to indicate that BUP/NX is less safe than BUP because BUP/NX has been more widely prescribed than BUP, and, unfortunately, many of these deaths (n=238) were reported to RBP without an assessment of the causality/role of buprenorphine in the death. It also is not known what proportion involved the use of benzodiazepines or other CNS depressants. However, one way to attempt to control for availability in calculation of death rates of BUP/NX versus BUP is to calculate patient treatment years assuming an average dose of 16 mg/day per patient based on amount of product sold (from 2003 for Suboxone® and Subutex® tablets and from September 2010 for Suboxone® film to September 2013; data not available for the generic products).

Calculations from RBP show that there have been 1,510,109 patient-treatment years (PTY) for Suboxone® (i.e., 981,056 PTY for Suboxone® tablets and 529,053 PTY for Suboxone® film) and 30,701 PTY for Subutex® tablets. Thus, exposure to Suboxone® products is 49-fold higher than to Subutex® tablets suggesting that the finding of 10-fold higher proportion of deaths involving BUP/NX than BUP is actually lower than expected, although this is not conclusive because the number of deaths included generic product while calculations of PTY excluded generics. It is critical to remember, too, that morbidity and mortality among untreated opioid dependent persons, including fetuses and neonates of pregnant women is higher than the general population without substance abuse (e.g., Alroomi 1988, Hulse 1998, Neumark 2000). For example, among pregnant opioid dependent women, other comorbid substance use, social situations (e.g., domestic violence, problems accessing prenatal care), and medical (e.g., infections) and psychiatric problems can all adversely impact fetal and neonatal outcomes (e.g., Jones and Kaltenbach 2013, Ludlow 2004). For instance, most pregnant opioid dependent women (~90%) smoke cigarettes (e.g., Tuten 2003, Quigley 2013), and cigarette smoking is an independent risk factor for spontaneous abortion, stillbirths and sudden infant death syndrome (Rogers 2008). Recommendations for improvement in substance-involved death data collection systems are listed in Table 3.

While the number of buprenorphine-related deaths are likely underestimated because coroners are/were not routinely testing for buprenorphine, the number of deaths involving full mu-agonist opioid analgesics is markedly higher. For instance, in the year 2008, the Centers for Disease Control and Prevention (CDC) reported 14,800 deaths due to prescription opioid analgesics, and there is no evidence that deaths involving this class of medication are declining.

There also have been increasing reports of pediatric exposures to buprenorphine (Boyer et al., 2010; Martin & Rocque, 2011; Pedapati & Bateman, 2011). The CDC (www.cdc.gov/mmwr/preview/mmwrhtml/mm6203a5.htm) reports that BUP/NX “caused 9.5% of emergency hospitalizations for drug ingestion by children less than 6 years, a greater proportion than any other single medication, even though in 2009 buprenorphine products amounted to only 2.2% of all retail opioid prescriptions and 0.16% of all retail prescriptions.” While the CDC did not differentiate between BUP/NX tablet and film exposures, a recent study reported significantly lower rates of unintentional exposures to BUP/NX film among children ages 28 days to 6 years old compared to BUP/NX tablet and BUP (Lavonas et al., 2013). It is important for all patients receiving buprenorphine to understand that ingestion of buprenorphine, even without other medications, can be deadly in children; the reported ceiling effects on respiratory depression in adults do not appear to apply to children (Kim et al., 2012). Unintentional exposures to children should be preventable. Physicians should discuss the necessity of safe storage with all patients because the source of medication ingested can be from family and friends, who may not have children themselves.

Overall, the safety profile of buprenorphine in the U.S. appears superior to that of methadone with 2- to 3-fold lower rates of drug diversion reports and poison center calls than methadone (Dasgupta et al., 2010). Also, similar to France, recent data reveal a significant relationship between a decline in heroin overdose deaths following the approval

and implementation of buprenorphine into the treatment system in Baltimore City, an area of the U.S. with particularly high rates of heroin abuse and heroin-related deaths (Schwartz et al., 2013).

In addition, the finding that benzodiazepines are most commonly associated with deaths related to buprenorphine, similar to their presence also in heroin, methadone, and full mu-opioid agonist prescription analgesic-related deaths, demonstrates that the respiratory depressant effects of buprenorphine are increased in the presence of benzodiazepines and alcohol as supported by mechanistic preclinical studies (e.g., Gueye et al., 2002; Pirnay et al., 2008 and others). Thus, benzodiazepine availability (and co-prescribing), diversion and misuse warrant increased attention from the medical, scientific and public policy makers because this drug class is contributing to public health harms. During the introduction of buprenorphine in France, a significant problem with concomitant benzodiazepine abuse arose with flunitrazepam, specifically. In response, the French Drug Agency modified the regulation of flunitrazepam to limit its prescription and dispensing and its abuse decreased. However, this was followed by a rise in abuse of clonazepam until its regulatory control was tightened in 2010 limiting its prescription to a maximum of 4 weeks as a hypnotic agent and 12 weeks as an anxiolytic (Frauger et al., 2013).

Recommended Practice Behaviors to Deter Misuse and Diversion

There are several published practice guidelines and recommendations for OBOT in the U.S., yet most have a very limited or no discussion about how to evaluate diversion and misuse of buprenorphine clinically nor do they provide strategies for screening, monitoring, or responding to these behaviors specifically within the outpatient setting of OBOT (Fiellin et al., 2004; Kosten and Fiellin, 2004; Kraus et al., 2011, CSAT 2004, CSAT 2005; www.fsmb.org/pdf/2013_model_policy_treatment_opioid_addiction.pdf, and <http://pcssmat.org/wp-site/wp-content/uploads/2014/02/PCSSMATGuidanceAdherence-diversion-bup.Martin.pdf>). This may be due, in part, to a lack of controlled studies that examine interventions to screen, monitor and reduce medication misuse and diversion. Moreover, there may be concern that, if these behaviors are acknowledged as occurring within U.S. OBOT treatment, it will result in burdensome regulations, such as mandatory supervised dosing for all patients as increased regulation has been a common response to diversion historically (Bell, 2010; Jaffe and O'Keeffe, 2003), or more extreme measures such as revocation of DATA 2000 or the rescheduling of buprenorphine to Schedule II (which would functionally preclude its use in OBOT). The goal here is to remind practitioners why diversion and misuse are deserving of clinical attention and to provide clinical recommendations for detecting, evaluating and responding therapeutically to these behaviors in order to retain patients in treatment and assist them in making positive changes in their recovery. Most of the clinical practices described are informed by basic principles of behavior analysis, addiction medicine and addiction psychiatry.

From the earlier discussion, it is clear that medication misuse and diversion are common behaviors and, when they occur within treatment, they indicate medication non-adherence. Non-adherence decreases treatment effectiveness (for all medical disorders) and is associated with illicit opioid relapse within OBOT (Tkacz et al., 2012). If one is interested in

decreasing relapse, one must become interested also in medication adherence. Thus, assessment for misuse and diversion is recommended at each clinical visit with placement of these behaviors on patients' problem list so they can be addressed therapeutically, rather than punitively.

A punitive "no tolerance" approach with automatic discharge from treatment is highly unlikely to help patients because untreated opioid addiction is characterized by relapse [continued use of illicit (i.e., diverted) opioids is the norm] and increased morbidity and mortality (McLellan et al., 2000). Good treatment benefits both individual and public health even when patients are unable to achieve continuous drug abstinence and cessation from all criminal activity and IVDU (National Consensus Development Panel on Effective Medical Treatment of Opiate Addiction, 1998; Carrieri et al., 2006). For example, a recent study compared three groups of injection drug users receiving needle-exchange services in Norway: 1) persons currently in addiction treatment with methadone or buprenorphine (n=341); 2) persons with no prior treatment with these medications (n=1063); and 3) persons who had prior, but not current, treatment with these medications (n=356). Those currently in treatment, despite continued IVDU, had significantly fewer non-fatal overdoses (O.R.=0.5), committed fewer thefts (O.R.=0.6) and reported dealing drugs (O.R.=0.7) less often in the prior month. They were also less likely to use heroin daily or near daily (O.R.=0.3) compared to the other groups that were not in treatment (Gjersing and Bretteville-Jensen, 2013). This does not imply that physicians must accept and do nothing about medication misuse and diversion or that they should continue to prescribe buprenorphine to patients who are distributing it to others rather than taking it themselves. Rather, the point is that treatment can be beneficial even if the ideal outcome is not attained (e.g., 100% medication adherence and abstinence from all substances of abuse). The goal is to evaluate treatment benefits and harms for each patient, individualizing the treatment plan in order to minimize harms without adversely affecting the benefits provided.

Reasons for buprenorphine diversion and misuse while in OBOT are listed in Table 1. Once providers understand the context and circumstances around these behaviors, practical solutions can be formulated. For instance, for a patient who encounters drug dealers every month at the pharmacy where they fill their prescription and are pressured to sell their medication, a recommendation to change pharmacies and assistance with finding financial help may be welcome if the medication is being sold to pay off old debts. For patients unable to escape from drug-addicted social networks, it may be helpful to discuss the option of maintaining a secretive status regarding having medication (Havnes et al., 2013).

Patients may not disclose medication misuse and diversion; however, some clinical practice behaviors (see Table 2), such as monitoring urine drug test outcomes, including for buprenorphine, are recommended and may be helpful. Inexpensive CLIA-waived urine tests for buprenorphine are now readily available in the U.S. In a cross-sectional study in India, 14% and 34% of patients receiving BUP/NX and BUP, respectively, tested negative for buprenorphine on random observed urine testing (Balhara and Jain, 2012). A test that is positive for buprenorphine but negative for its primary metabolite, norbuprenorphine, would also be incongruent with daily medication use. Admittedly, urine drug testing has limited practical use in detecting intermittent non-adherence due to the long half-life of

buprenorphine, as patients could skip medication for several days and still produce a urine screen positive for buprenorphine. State prescription monitoring reports are useful in detecting multiple buprenorphine prescribers simultaneously (e.g., doctor shopping) as well as receipt of other controlled substances. Random medication counts can also be done at the physician office or at the pharmacy in order to screen for potential diversion and misuse (Lofwall et al., 2010), although there are no data on the sensitivity or specificity of this approach. It is noteworthy that each individually packaged BUP/NX film product in the U.S. contains a unique 10-digit ID number and QR code that could be scanned at any point in the chain of medication distribution. While this tracking technology is not being used currently, it has the potential to trace medication found on the street back to the dispensing pharmacy, physician prescriber and patient recipient. This could be helpful for providers and patients if used therapeutically in treatment, but could be harmful if it became a law enforcement tool used primarily to punish providers and patients.

OBOT providers may want to consider how their practice, which should be comprised of numerous components (see Figure 1), can help minimize and respond to misuse and diversion when it occurs. To prevent attracting individuals who are seeking medication to sell on the street, the OBOT provider can make it clear at the time of scheduling the initial appointment that there are multiple aspects of treatment (e.g., assessment, monitoring), and frequent visits until stable. Providers may choose to explain that longer supplies of medication will be provided with increasing objective evidence of stability. This is a practical example of integrating contingency management into clinical practice. Contingency management is a highly effective behavioral therapy that uses positive reinforcers (e.g., longer duration of prescription or less frequent appointments) to encourage and promote desired behavioral changes, such as adherence and drug abstinence (Gerra et al., 2011; Stitzer and Vandrey, 2008). In order to avoid unintentional diversion (and pediatric exposures) from patients' prescription buprenorphine at home, all OBOT patients could be advised on safe storage practices (e.g., in a lock box and not in kitchens and bathrooms or other common areas where it could be easily "borrowed" or stolen). Use of the combined BUP/NX versus BUP formulation should be preferred for non-pregnant patients given its relative lower abuse liability. However, clinicians may be presented with pleas by patients for prescription of BUP over BUP/NX if generic BUP is significantly less expensive than BUP/NX, particularly for patients without health insurance. Such cases require a careful individual assessment and documentation of the individual risks and benefits of prescribing the formulation without naloxone (e.g., is no treatment the alternative? is this a high risk patient for IV misuse due to history of IVDU?), including a plan for monitoring and switching to product with naloxone should concerns about diversion and misuse arise. Therapeutic dosing and prescribing are also important. The FDA package insert for BUP/NX states that the upper recommended dose is 24 mg/day. Dosing above 24 mg/day is off-label; physicians should document a rationale for surpassing this dosage including showing that lower daily doses were not adequate. There are no studies to date showing that doses higher than 24mg/day produce superior results compared to 24 mg/day. Most patients will stabilize on doses between 8-24 mg/daily. Dosing should be flexible and incremental according to published practice guidelines. Therapeutic dosing must take into account both the evidence base and the individual patient response to medication, in order for dosing and

the overall treatment plan to be tailored to each individual patient. Providers should avoid 1) subtherapeutic dosing [e.g., inadequate opioid blockade (i.e., ability to still get high or have good effects from illicit opioid use while taking the prescribed buprenorphine dose) or inadequate withdrawal suppression], 2) suprathreshold dosing (which may allow patient to maintain stability while sharing or selling a portion of their medication) and 3) providing large drug supplies to unstable patients (e.g., several weeks or more), which can increase risk and provide opportunity for diversion and misuse.

When diversion and misuse are suspected or confirmed, potential responses include practical solutions individualized to the particular patient situation that were discussed earlier (if known), but also include more frequent clinic and/or counseling visits, smaller supplies of unsupervised medication (e.g., one week supply or less), and initiation of or increase in the frequency of supervised medication ingestion. Thrice-weekly dosing of buprenorphine under supervision is an effective treatment strategy that reduces clinic burden without compromising patient treatment outcomes compared to daily dosing under supervision (Amass et al, 2001; Bickel et al., 1999; Marsch et al., 2005). Observed ingestion at the OBOT clinic, pharmacy (more common outside of the U.S.) or by a trusted non-drug-using support that lives with or nearby the patient is another strategy to consider. For example, network therapy encourages patients to enlist non-drug-using supports in their treatment who can monitor medication ingestion. Network therapy has been shown to increase opioid abstinence significantly among heroin dependent adults in OBOT (50%) compared to standard medication management with counseling (23%) (Galanter et al., 2004). However, it is critical to avoid choosing support members with an abusive or exploitative relationship with the patient.

It is important to remember that supervised dosing does not eliminate diversion and misuse as highlighted earlier with the Australian experience. Liquid methadone and buprenorphine tablets can be held in cheeks and taken out of the mouth among patients motivated to misuse and divert if there is a brief lapse in supervision (e.g., supervisor turns around for a moment, lack of mouth check). A recent comparison between the BUP/NX tablet and film product suggests that supervision may be more effective with the film because it dissolves more quickly and is more mucoadhesive (i.e., stickier) than the tablet, making it difficult to remove from the mouth (Lintzeris et al., 2013). However, a recent study showed that under "supervision," doses of medication for opioid addiction treatment were removed among patients dispensed BUP/NX tablet (19%) and BUP/NX film (20%) (Larance et al., 2014). It is not clear if patients were able to slip medication from hand to pocket due to medication not being placed directly into the patient's mouth, or if there were other strategies (e.g., dry mouth and overlapping films that may decrease effective mucoadhesion). Notably, in this study, among patients receiving supervised BUP/NX film dosing, 43% reported that more than three films were placed in their mouth at once suggesting that overlap of films may have played a role.

Daily supervised dosing as a regulatory requirement for all patients may pose a barrier to treatment entry for patients, limit further treatment expansion (e.g., increased costs and requirements for storing and dispensing controlled drug from a clinic), and exacerbate the problems of untreated addiction. It is possible, however, that supervised dosing may be

helpful in circumstances where patients do not have safe storage options (e.g., homeless) or would benefit from the increased structure and clinic contact that supervised dosing can provide. While limited data exist on the frequency of supervised dosing and treatment outcomes, one randomized controlled study showed that thrice-weekly versus once-weekly supervised buprenorphine dosing in OBOT produced only modest decreases in patient treatment satisfaction and no differences in treatment retention, opioid use, or medication adherence (Barry et al., 2007; Fiellin et al., 2006). Some patients may require an alternative treatment setting or pharmacotherapy, such as methadone (Kakko et al., 2007). Improving linkages between practices and providers which vary in their intensity and setting are necessary for flexible and uninterrupted quality care.

Conclusions

Overall, buprenorphine diversion and misuse appear to be common behaviors of opioid addicted individuals, whereby the frequency of use of diverted medication, route of misuse, and subsequent harms are influenced by a variety of factors. These factors include the pharmacologic profile of the particular buprenorphine formulations, physical dependence status of the individual, individual experience with route of drug use, availability of buprenorphine or alternative opioids in the environment, and public policies within and surrounding geographic areas regarding opioid addiction treatment services. Table 3 suggests areas for future clinical research where current gaps in knowledge exist. Unfortunately, deaths involving buprenorphine have occurred around the globe, most commonly in combination with CNS depressants, and in the U.S., deaths involving buprenorphine are far fewer in number compared to deaths involving methadone and other full-mu opioid agonist prescription analgesics. Importantly, epidemiologic data from France and the U.S. showed that with OBOT expansion, there was an overall decrease in drug overdose deaths. Thus, any steps taken to minimize buprenorphine diversion and misuse must be careful not to undermine the positive patient and public health benefits gained from expanded treatment access.

Acknowledgments

The authors thank Vickie Seeger and Rolley E. Johnson PharmD from Reckitt Benckiser Pharmaceuticals for their sharing of U.S. death reports involving buprenorphine products and Dr. Kaarlo Simojoki for providing information about the opioid addiction treatment system and heroin supply in Finland.

Conflicts of interest and source of funding. The source of funding for this review is, in part, derived from NIDA grant R01DA016718 and R01DA033932 (SLW). Drs. Lofwall and Walsh are on the steering committee for the European Quality Patient Care Network that is part of PCM Scientific (a British educational company) and have received payment from PCM Scientific for developing educational materials and giving educational talks. In addition, Dr. Walsh has received payment for Chairing and organizing a three-day conference supported by PCM Scientific through an unrestricted grant from Reckitt Benckiser. Dr. Lofwall has been a consultant for Orexo Pharmaceuticals and has had research contract funding from CRS Associates in the past (contract funding goes to her institution). Dr. Walsh has received payment for service on a Safety Advisory Board for MEDA Pharmaceuticals and for service on the American Society of Addiction Medicine Board Exam Committee. She has served as a consultant for DemeRx, Eli Lilly and Co., KSI Consulting, MedSignals and Cephalon. She has received honoraria and travel reimbursement for participating in educational meetings for physicians through Real Science Communications and the University of Kentucky.

References

- Aboltins CA, Allen P, Daffy JR. Fungal endophthalmitis in intravenous drug users injecting buprenorphine contaminated with oral *Candida* species. *Med J Aust.* 2005; 182:427. [PubMed: 15850443]
- Amass L, Kamien JB, Mikulich SK. Thrice-weekly supervised dosing with the combination buprenorphine-naloxone tablet is preferred to daily supervised dosing by opioid-dependent humans. *Drug Alcohol Depend.* 2001; 61:173–181. [PubMed: 11137282]
- National Consensus Development Panel on Effective Medical Treatment of Opiate Addiction. Effective Medical Treatment of Opiate Addiction. *JAMA.* 1998; 280:1936–1943. [PubMed: 9851480]
- Alho H, Sinclair D, Vuori E, et al. Abuse liability of buprenorphine-naloxone tablets in untreated IV drug users. *Drug Alcohol Depend.* 2007; 88:75–78. [PubMed: 17055191]
- Alroomi LG, Davidson J, Evans TJ, et al. Maternal narcotic abuse and the newborn. *Arch Dis Child.* 1988; 63:81–3. [PubMed: 3348657]
- American Society of Addiction Medicine (ASAM). Advancing Access to Addiction Medications: Implications for Opioid Addiction Treatment. A Project of the ASAM. 2013. Available on-line <http://www.asam.org/docs/advocacy/Implications-for-Opioid-Addiction-Treatment>
- Auriacombe M, Fatseas M, Dubernet J, et al. French field experience with buprenorphine. *Am J Addict.* 2004; 13:S17–28. [PubMed: 15204673]
- Auriacombe M, Franques P, Tignol J. Deaths attributable to methadone vs buprenorphine in France. *JAMA.* 2001; 285:45. [PubMed: 11150107]
- Balhara Y, Jain R. A Urinalysis-based comparative study of treatment adherence on buprenorphine and buprenorphine/naloxone combination used as opioid substitution treatment. *Innov Clin Neurosci.* 2012; 9:24–29. [PubMed: 22984649]
- Barry DT, Moore BA, Pantalon MV, et al. Patient satisfaction with primary care office-based buprenorphine/naloxone treatment. *J Gen Intern Med.* 2007; 22:242–245. [PubMed: 17356993]
- Bazazi AR, Yokell M, Fu JJ, et al. Illicit use of buprenorphine/naloxone among injecting and noninjecting opioid users. *J Addict Med.* 2011; 5:175–180. [PubMed: 21844833]
- Bell J. The global diversion of pharmaceutical drugs: opiate treatment and the diversion of pharmaceutical opiates: a clinician's perspective. *Addiction.* 2010; 105:1531–1537. [PubMed: 20626373]
- Berson A, Gervais A, Cazals D, et al. Hepatitis after intravenous buprenorphine misuse in heroin addicts. *J Hepatol.* 2001; 34:346–350. [PubMed: 11281569]
- Bickel WK, Amass L, Crean JP, Badger GJ. Buprenorphine dosing every 1, 2, or 3 days in opioid-dependent patients. *Psychopharmacology (Berl).* 1999; 46:111–118. [PubMed: 10525745]
- Bloms-Funke P, Gillen C, Schuettler AJ, et al. Agonistic effects of the opioid buprenorphine on the nociceptin/OFQ receptor. *Peptides.* 2000; 21:1141–1146. [PubMed: 10998549]
- Boyer EW, McCance-Katz EF, Marcus S. Methadone and buprenorphine toxicity in children. *Am J Addict.* 2010; 19:89–95. [PubMed: 20132125]
- Carrieri MP, Amass L, Lucas GM, et al. Buprenorphine use: the international experience. *Clin Infect Dis.* 2006; 43:S197–215. [PubMed: 17109307]
- Cassoux N, Bodaghi B, Lehoang P, et al. Presumed ocular candidiasis in drug misusers after intravenous use of oral high dose buprenorphine (Subutex). *Br J Ophthalmol.* 2002; 86:940–941. [PubMed: 12140228]
- Caviness CM, Anderson BJ, de Dios MA, et al. Prescription medication exchange patterns among methadone maintenance patients. *Drug Alcohol Depend.* 2013; 127:232–238. [PubMed: 22854293]
- Center for Substance Abuse Research (CESAR). Buprenorphine availability, diversion, misuse: A summary of the CESAR FAX Series. 2011; 20(34)
- Center for Substance Abuse Treatment (CSAT). Clinical guidelines for the use of buprenorphine in the treatment of opioid addiction. Substance Abuse and Mental Health Services Administration;

- Rockville, MD: 2004. Treatment Improvement Protocol (TIP) Series 40. DHHS Publication No. (SMA) 04-3939
- CSAT. Medication-assisted treatment for opioid addiction in opioid treatment programs. Substance Abuse and Mental Health Services Administration; Rockville, MD: 2005. Treatment Improvement Protocol (TIP) Series 43. DHHS Publication No. (SMA) 06-4214
- Cicero TJ, Surratt HL, Inciardi J. Use and misuse of buprenorphine in the management of opioid addiction. *J Opioid Manag.* 2007; 3:302–308. [PubMed: 18290581]
- Comer SD, Sullivan MA, Vosburg SK, et al. Abuse liability of intravenous buprenorphine/naloxone and buprenorphine alone in buprenorphine-maintained intravenous heroin abusers. *Addiction.* 2010; 105:709–718. [PubMed: 20403021]
- Cowan, A.; Lewis, J. *Buprenorphine: Combatting Drug Abuse with a Unique Opioid.* Wiley Liss; New York: 1995.
- Dart, RC. 5th Annual Scientifica Meeting Presentation. Evaluation of ADFs using RADARS system data. 2011. Slides available at <http://www.radars.org/Home2/AnnualMeeting/RADARSSystem2011AnnualMeeting.aspx>
- Dasgupta N, Bailey EJ, Cicero T, et al. Post-marketing surveillance of methadone and buprenorphine in the United States. *Pain Med.* 2010; 11:1078–1091. [PubMed: 20545875]
- Degenhardt L, Larance BK, Bell JR, et al. Injection of medications used in opioid substitution treatment in Australia after the introduction of a mixed partial agonist-antagonist formulation. *Med J Aust.* 2009; 191:161–165. [PubMed: 19645647]
- Department of Health and Human Services (DHHS). Department of Health and Human Services 42 CFR Part 8 RIN 0930 AA14. 2012. available @<http://www.gpo.gov/fdsys/pkg/FR-2012-12-06/html/2012-29417.htm>
- Fiellin DA, Kleber H, Trumble-Hejduk JG, et al. Consensus statement on office-based treatment of opioid dependence using buprenorphine. *J Subst Abuse Treat.* 2004; 27:153–159. [PubMed: 15450648]
- Fiellin DA, Pantalon MV, Chawarski MC, et al. Counseling plus buprenorphine-naloxone maintenance therapy for opioid dependence. *N Engl J Med.* 2006; 355:365–374. [PubMed: 16870915]
- Forsell, M.; Virtanen, A.; Jaaskelainen, M., et al. Drug Situation in Finland 2010. National report to the EMCDDA by the Finnish National Focal Point. National Institute for Helath and Welfare (THL). Report 39/2010. Available on-line @<http://www.thl.fi/thl-client/pdfs/7445c896-5bc1-4bbc-b9e3-f41be4fa94e5>
- Frauger E, Moracchini C, Le Boisselier R, et al. OPPIDUM surveillance program: 20 years of information on drug abuse in France. *Fundam Clin Pharmacol.* 2013:1–11.
- Galanter M, Dermatis H, Glickman L, et al. Network therapy: decreased secondary opioid use during buprenorphine maintenance. *J Subst Abuse Treat.* 2004; 26:313–318. [PubMed: 15182896]
- Gerra G, Saenz E, Busse A, et al. Supervised daily consumption, contingent take-home incentive and non-contingent take-home in methadone maintenance. *Prog Neuropsychopharmacol Biol Psychiatry.* 2011; 35:483–489. [PubMed: 21147192]
- Gjersing L, Bretteville-Jensen AL. Is opioid substitution treatment beneficial if injecting behaviour continues? *Drug Alcohol Depend.* 2013; 133:121–126. [PubMed: 23773951]
- Goldsworthy RC, Schwartz NC, Mayhorn CB. Beyond abuse and exposure: framing the impact of prescription-medication sharing. *Am J Public Health.* 2008; 98:1115–1121. [PubMed: 18445792]
- Gouny P, Gaitz JP, Vayssairat M. Acute hand ischemia secondary to intraarterial buprenorphine injection: treatment with iloprost and dextran-40--a case report. *Angiology.* 1999; 50:605–606. [PubMed: 10432001]
- Gueye PN, Borron SW, Risede P, et al. Buprenorphine and midazolam act in combination to depress respiration in rats. *Toxicol Sci.* 2002; 65:107–114. [PubMed: 11752690]
- Hakkinen M, Launiainen T, Vuori E, et al. Benzodiazepines and alcohol are associated with cases of fatal buprenorphine poisoning. *Eur J Clin Pharmacol.* 2012; 68:301–309. [PubMed: 21927835]
- Havnes IA, Clausen T, Middelthun AL. 'Diversion' of methadone or buprenorphine: 'harm' versus 'helping'. *Harm Reduct J.* 2013; 10:24. [PubMed: 24131626]
- Herve S, Riachi G, Noblet C, et al. Acute hepatitis due to buprenorphine administration. *Eur J Gastroenterol Hepatol.* 2004; 16:1033–1037. [PubMed: 15371928]

J Addict Med. Author manuscript; available in PMC 2015 September 01.

- Ho RC, Ho EC, Tan CH, et al. Pulmonary hypertension in first episode infective endocarditis among intravenous buprenorphine users: case report. *Am J Drug Alcohol Abuse*. 2009; 35:199–202. [PubMed: 19462305]
- Hulse GK, Milne E, English, et al. Assessing the relationship between maternal opiate use and antepartum haemorrhage. *Addiction*. 1998; 93:1553–8. [PubMed: 9926560]
- Jaffe JH, O'Keefe C. From morphine clinics to buprenorphine: regulating opioid agonist treatment of addiction in the United States. *Drug Alcohol Depend*. 2003; 70:S3–11. [PubMed: 12738346]
- Johanson CE, Arfken CL, di Menza S, et al. Diversion and abuse of buprenorphine: findings from national surveys of treatment patients and physicians. *Drug Alcohol Depend*. 2012; 120:190–195. [PubMed: 21862241]
- Jones, HE., Kaltenbach, K. Treating women with substance use disorders during pregnancy: a comprehensive approach to caring for mother and child. Oxford University Press; 2013.
- Kakko J, Gronbladh L, Svanborg KD, et al. A stepped care strategy using buprenorphine and methadone versus conventional methadone maintenance in heroin dependence: a randomized controlled trial. *Am J Psychiatry*. 2007; 164:797–803. [PubMed: 17475739]
- Kim HK, Smiddy M, Hoffman RS, Nelson LS. Buprenorphine may not be as safe as you think: a pediatric fatality from unintentional exposure. *Pediatrics*. 2012; 130(6):e1700–1703. [PubMed: 23129079]
- Kosten TR, Fiellin DA, et al. Buprenorphine for office-based practice: consensus conference overview. *Am J Addict*. 2004; 13:S1–7. [PubMed: 15204671]
- Kraus ML, Alford DP, Kotz MM, et al. Statement of the American Society Of Addiction Medicine Consensus Panel on the use of buprenorphine in office-based treatment of opioid addiction. *J Addict Med*. 2011; 5:254–263. [PubMed: 22042215]
- Larance B, Degenhardt L, Lintzeris N, et al. Post-marketing surveillance of buprenorphine-naloxone in Australia: diversion, injection and adherence with supervised dosing. *Drug Alcohol Depend*. 2011a; 118:265–273. [PubMed: 21565452]
- Larance B, Degenhardt L, Lintzeris N, et al. Definitions related to the use of pharmaceutical opioids: extramedical use, diversion, non-adherence and aberrant medication-related behaviours. *Drug Alcohol Rev*. 2011b; 30:236–245. [PubMed: 21545553]
- Larance B, Lintzeris N, Ali R, Dietze, et al. The diversion and injection of a buprenorphine-naloxone soluble film formulation. *Drug Alcohol Depend*. 2014; 136:21–27. [PubMed: 24461476]
- Lavonas EJ, Banner W, Bradt P, et al. Root causes, clinical effects, and outcomes of unintentional exposures to buprenorphine by young children. *J Pediatr*. 2013; 163:1377–1383. e1371–1373. [PubMed: 23993129]
- Lintzeris N, Leung SY, Dunlop AJ, et al. A randomised controlled trial of sublingual buprenorphine-naloxone film versus tablets in the management of opioid dependence. *Drug Alcohol Depend*. 2013; 131:119–126. [PubMed: 23317685]
- Lofwall MR, Havens JR. Inability to access buprenorphine treatment as a risk factor for using diverted buprenorphine. *Drug Alcohol Depend*. 2012; 126:379–383. [PubMed: 22704124]
- Lofwall MR, Wunsch MJ, Nuzzo PA, Walsh SL. Efficacy of continuing medical education to reduce the risk of buprenorphine diversion. *J Subst Abuse Treat*. 2011; 41:321–9. [PubMed: 21664789]
- Lofwall MR, Wunsch MJ, Walsh SL. Pharmacy willingness to partner with office-based opioid dependence treatment providers in conducting random buprenorphine pill counts. *Am J Addict*. 2010; 19:195–196. [PubMed: 20163395]
- Ludlow JP, Evans SF, Hulse G. Obstetric and perinatal outcomes in pregnancies associated with illicit substance abuse. *Aust N Z J Obstet Gynaecol*. 2004; 44:302–6. [PubMed: 15282000]
- Marsch LA, Bickel WK, Badger GJ, et al. Buprenorphine treatment for opioid dependence: the relative efficacy of daily, twice and thrice weekly dosing. *Drug Alcohol Depend*. 2005; 77:195–204. [PubMed: 15664721]
- Martin TC, Rocque MA. Accidental and non-accidental ingestion of methadone and buprenorphine in childhood: a single center experience, 1999-2009. *Curr Drug Saf*. 2011; 6:12–16. [PubMed: 21047302]

- McLellan AT, Lewis DC, O'Brien CP, et al. Drug dependence, a chronic medical illness: implications for treatment, insurance, and outcomes evaluation. *JAMA*. 2000; 284:1689–1695. [PubMed: 11015800]
- Mendelson J, Jones RT, Welm S, et al. Buprenorphine and naloxone combinations: the effects of three dose ratios in morphine-stabilized, opiate-dependent volunteers. *Psychopharmacology (Berl)*. 1999; 141:37–46. [PubMed: 9952063]
- Middleton LS, Nuzzo PA, Lofwall MR, et al. The pharmacodynamic and pharmacokinetic profile of intranasal crushed buprenorphine and buprenorphine/naloxone tablets in opioid abusers. *Addiction*. 2011; 106:1460–1473. [PubMed: 21395892]
- Moratti E, Kashaipour H, Lombardelli T, et al. Intravenous misuse of buprenorphine: characteristics and extent among patients undergoing drug maintenance therapy. *Clin Drug Investig*. 2010; 30:S3–11.
- Morrison V. Psychoactive substance use and related behaviours of 135 regular illicit drug users in Scotland. *Drug Alcohol Depend*. 1989; 23:95–101. [PubMed: 2702930]
- National Bureau of Investigation (NBI). NBI of Finland. Archive IDKRP/RTP 7433/213/2003. 2003.
- Neumark YD, Van Etten ML, Anthony JC. "Drug dependence" and death: survival analysis of the Baltimore ECA sample from 1981-1995. *Subst Use Misuse*. 2000; 35:313–27. [PubMed: 10714449]
- Nordmann S, Frauger E, Pauly V, et al. Misuse of buprenorphine maintenance treatment since introduction of its generic forms: OPPIDUM survey. *Pharmacoepidemiol Drug Saf*. 2012; 21:184–190. [PubMed: 22109894]
- Pedapati EV, Bateman ST. Toddlers requiring pediatric intensive care unit admission following at-home exposure to buprenorphine/naloxone. *Pediatr Crit Care Med*. 2011; 12:e102–107. [PubMed: 20921918]
- Pirnay SO, Megarbane B, Borron SW, et al. Effects of various combinations of benzodiazepines with buprenorphine on arterial blood gases in rats. *Basic Clin Pharmacol Toxicol*. 2008; 103:228–239. [PubMed: 18684226]
- Quigley J, Knudsen HK, Nuzzo PA, et al. Substance Use Characteristics and Treatment Perceptions Among Opioid Dependent Pregnant Women Initiating Methadone Treatment. *Journal of Kentucky Medical Association*. 2013; 111:261–5.
- Reynaud M, Petit G, Potard D, et al. Six deaths linked to concomitant use of buprenorphine and benzodiazepines. *Addiction*. 1998; 93:1385–1392. [PubMed: 9926544]
- Rogers JM. Tobacco and pregnancy: overview of exposures and effects. *Birth Defects Res C Embryo Today*. 2008; 84:1–15. [PubMed: 18383133]
- Rosado J, Walsh SL, Bigelow GE, et al. Sublingual buprenorphine/naloxone precipitated withdrawal in subjects maintained on 100mg of daily methadone. *Drug Alcohol Depend*. 2007; 90:261–269. [PubMed: 17517480]
- Roux P, Villes V, Blanche J, et al. Buprenorphine in primary care: risk factors for treatment injection and implications for clinical management. *Drug Alcohol Depend*. 2008; 97:105–113. [PubMed: 18479840]
- Substance Abuse and Mental Health Services Administration (SAMHSA). National Survey on Drug Use and Health Detailed Tables. 2012. accessed online @<http://www.samhsa.gov/data/NSDUH/2012SummNatFindDetTables/DetTabs/NSDUH-DetTabsSect1peTabs1to46-2012.htm> - Tab1.17A
- Schwartz RP, Gryczynski J, O'Grady KE, et al. Opioid agonist treatments and heroin overdose deaths in Baltimore, Maryland, 1995-2009. *Am J Public Health*. 2013; 103:917–922. [PubMed: 23488511]
- Selden T, Ahlner J, Druid H. Toxicological and pathological findings in a series of buprenorphine related deaths. Possible risk factors for fatal outcome. *Forensic Sci Int*. 2012; 220:284–290. et al. [PubMed: 22565115]
- Simojoki K, Alho H. A Five-year follow-up of buprenorphine abuse potential. *J Alcohol Drug Depend*. 2013; 1:1–6. 2013.
- Singh RA, Mattoo SK, Malhotra A, Varma VK. Cases of buprenorphine abuse in India. *Acta Psychiatr Scand*. 1992; 86:46–48. [PubMed: 1414399]

J Addict Med. Author manuscript; available in PMC 2015 September 01.

- Stitzer ML, Vandrey R. Contingency management: utility in the treatment of drug abuse disorders. *Clin Pharmacol Ther.* 2008; 83:644–647. [PubMed: 18305456]
- Stoller KB, Bigelow GE, Walsh SL, et al. Effects of buprenorphine/naloxone in opioid-dependent humans. *Psychopharmacology (Berl).* 2001; 154:230–242. [PubMed: 11351930]
- Stover H. Barriers to opioid substitution treatment access, entry and retention: a survey of opioid users, patients in treatment, and treating and non-treating physicians. *Eur Addict Res.* 2011; 17:44–54. [PubMed: 20975276]
- Strain EC, Preston KL, Liebson IA, Bigelow GE. Acute effects of buprenorphine, hydromorphone and naloxone in methadone-maintained volunteers. *J Pharmacol Exp Ther.* 1992; 261:985–993. [PubMed: 1376362]
- Strain EC, Stoller K, Walsh SL, et al. Effects of buprenorphine versus buprenorphine/naloxone tablets in non-dependent opioid abusers. *Psychopharmacology (Berl).* 2000; 148:374–383. [PubMed: 10928310]
- Thirion X, Lapierre V, Micallef J, et al. Buprenorphine prescription by general practitioners in a French region. *Drug Alcohol Depend.* 2002; 65:197–204. [PubMed: 11772481]
- Tkacz J, Severt J, Cacciola J, et al. Compliance with buprenorphine medication-assisted treatment and relapse to opioid use. *Am J Addict.* 2012; 21:55–62. [PubMed: 22211347]
- Tracqui A, Kintz P, Ludes B. Buprenorphine-Related Deaths Among Drug Addicts in France: A Report on 20 Fatalities. *J Anal Toxicol.* 1998; 22:430–434. 1998. [PubMed: 9788517]
- Tuten M, Jones HE, Svikis DS. Comparing homeless and domiciled pregnant substance dependent women on psychosocial characteristics and treatment outcomes. *Drug Alcohol Depend.* 2003; 69:95–9. [PubMed: 12536070]
- Uosukainen H, Bell JS, Laitinen K, et al. First insights into community pharmacy based buprenorphine-naloxone dispensing in Finland. *Int J Drug Policy.* 2013a; 24:492–497. [PubMed: 23567099]
- Uosukainen H, Kauhanen J, Bell JS, et al. Mortality among clients seeking treatment for buprenorphine abuse in Finland. *Drug Alcohol Depend.* 2013b; 133:391–397. [PubMed: 23896305]
- Uosukainen H, Kauhanen J, Voutilainen S, et al. Twelve-year trend in treatment seeking for buprenorphine abuse in Finland. *Drug Alcohol Depend.* 2013c; 127:207–214. [PubMed: 22835477]
- Vicknasingam B, Mazlan M, Schottenfeld RS, et al. Injection of buprenorphine and buprenorphine/naloxone tablets in Malaysia. *Drug Alcohol Depend.* 2010; 111:44–49. [PubMed: 20478668]
- Vidal-Trecan G, Varescon I, Nabet N, et al. Intravenous use of prescribed sublingual buprenorphine tablets by drug users receiving maintenance therapy in France. *Drug Alcohol Depend.* 2003; 69:175–181. [PubMed: 12609698]
- Vignau J, Duhamel A, Catteau J, et al. Practice-based buprenorphine maintenance treatment (BMT): how do French healthcare providers manage the opiate-addicted patients? *J Subst Abuse Treat.* 2001; 21:135–144. [PubMed: 11728787]
- Waller BF, Brownlee WJ, Roberts WC. Self-induced pulmonary granulomatosis. A consequence of intravenous injection of drugs intended for oral use. *Chest.* 1980; 78:90–94. [PubMed: 7471850]
- Walsh SL, June HL, Schuh KJ, et al. Effects of buprenorphine and methadone in methadone-maintained subjects. *Psychopharmacology (Berl).* 1995; 119:268–276. [PubMed: 7675960]
- Walsh SL, Preston KL, Stitzer ML, et al. Clinical pharmacology of buprenorphine: ceiling effects at high doses. *Clin Pharmacol Ther.* 1994; 55:569–580. [PubMed: 8181201]

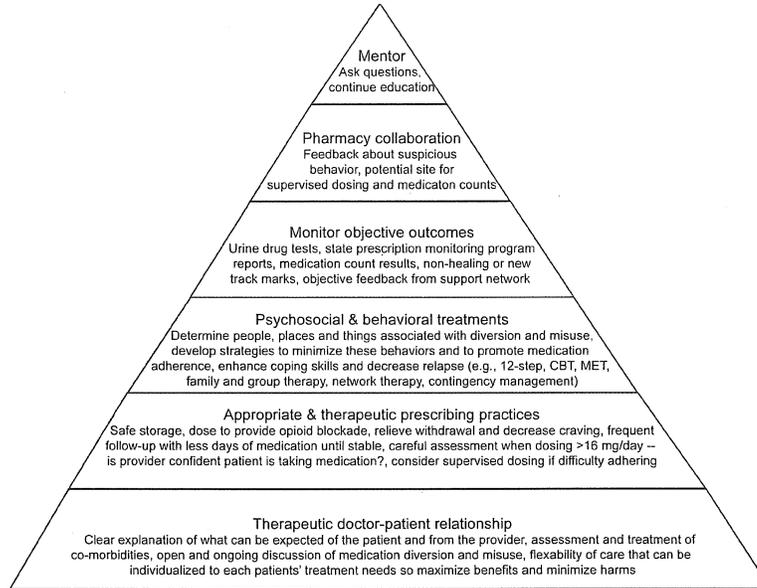


Figure 1. Components of outpatient opioid dependence treatment. A detailed explanation of the practices detailed in this figure can be viewed on-line @ <http://www.cecentral.com/buprecme> (Lofwall et al., 2011).

TABLE 1

Patient reasons for medication diversion and misuse while in OBOT

Reasons for diversion	Reasons for misuse
Peer pressure (e.g., expectation that medication is shared, may be facilitated by excessively high daily doses and large supplies)	Habit (e.g., history of IV or intranasal drug use increases risk of injecting or snorting medication, respectively)
Help addicted friend or family member	Perceived under-dosing
Make money (e.g., pay off bad debt, pay for living expenses/medical fees, to buy preferred opioid for misuse)	Relieve opioid withdrawal, craving and/or treat addiction
	Achieve positive effects (e.g., get high, increased energy)
	Relieve negative states (e.g., pain, anxiety, depression)

TABLE 2

Checklist to help detect diversion and misuse while in OBOT

Practice behavior	Explanation/Examples
Talk	Define diversion and misuse with each patient, ask for patient to give examples of each from their experience with illicit drug use, discuss potential triggers for each patient, develop strategies to combat these behaviors, follow-up at each visit about occurrences or close-calls of medication diversion and misuse just as with use of illicit opioid of choice; discuss openly throughout treatment
Examine	Non-healing or fresh track marks or intranasal erythema may indicate buprenorphine injection or intranasal use, respectively, or that other substances are being misused whereby the medication could be sold/traded for the opioid of choice. Lack of objective signs of opioid withdrawal despite ongoing patient report of severe withdrawal.
Listen	Repeated requests for early refills due to various reasons [lost, stolen or washed (forgot to take out of clothing) medications]
Monitor	Missing appointments, incorrect medication tablet/film counts, urine tests with absence of buprenorphine and/or norbuprenorphine, unexpected medical problems for a patient believed to be in recovery (e.g., abscesses), state prescription monitoring reports showing ongoing receipt of prescription opioids or other controlled substances that the patient denied being prescribed and/or multiple prescriptions from different OBOT providers over the same time period
Collaborate	Feedback from pharmacist about unusual behavior from patient, such as appearing intoxicated or being accompanied by someone who appears to be overly interested in the medication, exchange of something in parking lot or in waiting area. Counselor and family members who are not currently addicted and who have patients' best interest in mind report patient contact with old drug-using friends or non-adherence with medication if they are supervising ingestion.

TABLE 3

Ongoing clinical research needs

Develop sensitive and specific clinical methods for detecting misuse and diversion while in treatment
Develop efficacious prevention techniques and therapeutic responses to diversion and misuse that do not adversely affect treatment access or erode treatment benefits
Evaluate impact of public policy, including insurer and provider incentives and/or punishments that may inadvertently promote misuse and diversion and prevent therapeutic responses (e.g., limitations on number of provider visits, US Drug Enforcement Agency regulations that do not allow for a OBOT provider to store a patient's prescription medication once dispensed to patient, even if for purpose of supervised dosing at OBOT clinic)
Quantify amount of off-label prescribing of buprenorphine for pain and its relationship to diversion and misuse
Determine impact of product packaging on diversion and misuse and pediatric exposures
Continue drug development and consider alternative pharmaceutical abuse deterrents (e.g., higher naloxone: buprenorphine ratios, alternative abuse deterrent formulations, depot formulations)
Improve fatal substance overdose data collection systems to
<ol style="list-style-type: none"> 1. ensure comprehensive assessment of all substances present at the time of death, including both controlled and un-controlled substances [commonly prescribed non-controlled substances may also contribute to fatal outcomes (e.g., anti-hypertensives, antipsychotics)], 2. clarify whether involved substances were prescribed or not prescribed (indicating diversion) to decedents, and 3. include whether there is evidence of new or chronic use of each substance.
This information could be used to learn how prescribing practices and patient use patterns of prescribed or diverted substances contribute to overdose mortality and aid in the development of targeted interventions.



NIH Public Access

Author Manuscript

Drug Alcohol Depend

Published in final edited form as:

Drug Alcohol Depend. 2012 December 1; 126(3): 379–383. doi:10.1016/j.drugalcdep.2012.05.025.

Inability to access buprenorphine treatment as a risk factor for using diverted buprenorphine

Michelle R. Lofwall^{1,2} and Jennifer R. Havens^{2,3}

¹Department of Psychiatry, University of Kentucky College of Medicine, Lexington, Kentucky

²Center on Drug and Alcohol Research, Department of Behavioral Science, University of Kentucky College of Medicine, Lexington, Kentucky

³Department of Epidemiology, University of Kentucky College of Public Health, Lexington, Kentucky

Abstract

Background—As buprenorphine prescribing has increased in the United States so have reports of its diversion. The study purpose was to examine frequency and source of and risk factors for diverted buprenorphine use over a 6-month period in an Appalachian community sample of prescription opioid abusers.

Methods—There were 503 participants at baseline; 471 completed the 6-month follow-up assessment. Psychiatric disorders and demographic, drug use, and social network characteristics were ascertained at baseline and follow-up. Multivariable logistic regression was used to determine the predictors of diverted buprenorphine use over the 6-month period.

Results—Lifetime buprenorphine use “to get high” was 70.1%. Nearly half (46.5%) used diverted buprenorphine over the 6-month follow-up period; among these persons, 9.6% and 50.6% were daily and sporadic (1–2 uses over the 6-months) users, respectively. The most common sources were dealers (58.7%) and friends (31.6%). Predictors of increased risk of use of diverted buprenorphine during the 6-month follow-up included inability to access buprenorphine treatment (AOR: 7.31, 95% CI: 2.07, 25.8), meeting criteria for generalized anxiety disorder, and past 30 day use of OxyContin, methamphetamine and/or alcohol.

Conclusions—These results suggest that improving, rather than limiting, access to good quality affordable buprenorphine treatment may be an effective public health strategy to mitigate buprenorphine abuse. Future work should evaluate why more persons did not attempt to access treatment, determine how motivations change over time, and how different motivations affect diversion of the different buprenorphine formulations.

© 2012 Elsevier Ireland Ltd. All rights reserved.

Corresponding Author: Michelle R. Lofwall, Center on Drug and Alcohol Research, 515 Oldham Court, Lexington, KY 40502, michelle.lofwall@uky.edu, Office: (859) 323-6774, Fax: (859) 257-5232.

Contributors. Dr. Havens designed the study, wrote the protocol, and conducted the statistical analyses. Drs. Havens and Lofwall managed the literature searches, summaries of previous related work, and wrote the manuscript. Both authors contributed to and have approved the final manuscript.

Conflicts of Interest. Dr. Lofwall has received honoraria for giving continuing medical education presentations from Reckitt Benckiser Pharmaceutical (RBP) and has received an investigator-initiated research project grant from RBP in the last three years.

Publisher's Disclaimer: This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

\$watermark-text

\$watermark-text

\$watermark-text

Keywords

diversion; prescription opioids; buprenorphine; abuse; opioid dependence treatment

1. Introduction

Office-based opioid dependence treatment (OBOT) with buprenorphine (non-generic and generic buprenorphine tablets, and non-generic buprenorphine tablets and film) in the United States (US) has grown considerably since its Food and Drug Administration approval in 2002. In 2010 there were approximately 500,000 unique recipients of buprenorphine (Dart, 2011). However, with increased buprenorphine availability, there have been increased reports of buprenorphine misuse and diversion. Specifically, U.S. emergency department (ED) visits related to buprenorphine misuse/abuse according to the Drug Abuse Warning Network (DAWN) increased from 5025 visits in 2006 to 17,546 visits in 2009, National Forensic Laboratory Information System (NFLIS) seizures (representing diverted buprenorphine) increased from 446 in 2005 to 6722 in 2009, and Poison Control Center exposures increased from 765 in 2006 to 3212 in 2009. These increases were primarily, but not entirely, accounted for by the increased amounts of non-generic buprenorphine tablets sold over these years (Johanson et al., 2012). Specifically, there were an excess of 20 DAWN ED visits, 46 NFLIS seizures, and 23 Poison Control Center exposures per year for each additional million tablets sold per year.

Determining risk factors for use of diverted buprenorphine is a critical step in order to develop public health strategies to mitigate this adverse event. Studies in France show that prior drug use by intravenous and intranasal routes predict buprenorphine misuse via intravenous and intranasal routes, respectively (Roux et al., 2008a; Roux et al., 2008b; Vidal-Treca et al., 2003). However, there are no prospective data regarding predictors of diverted buprenorphine use within the US. Thus, the purpose of this study was to prospectively evaluate the risk factors, frequency and source of buprenorphine used among a community sample of prescription opioid abusers. Both individual and social network-level characteristics were examined. Social networks influence drug use initiation and continuation (Valente et al., 2004), but their role in buprenorphine diversion has not yet been evaluated.

2. Methods

2.1 Study design and population

This prospective analysis is nested within an ongoing longitudinal cohort study of social networks and HIV risk among rural Appalachian drug users. Inclusion criteria included: 1) age 18 years or older; 2) residing in an Appalachian Kentucky county; and 3) recent (i.e., last 30-day) use of prescription opioids, heroin, cocaine and/or methamphetamine. Participants were compensated \$50 per study visit. The University of Kentucky Institutional Review Board approved the study.

2.2 Sampling

The cohort was recruited using Respondent Driven Sampling (RDS) that is effective in recruiting hard-to-reach populations, including rural drug users (Heckathorn, 1997; 2002; Wang et al., 2007). Initial recruits (i.e., seeds) were identified through community outreach, word-of-mouth, and flyers. Each seed was given three coupons with which to recruit their peers. Seeds received \$10 for each redeemed coupon. Recruited peers then were asked to recruit their peers and so on, until the desired sample size was reached (n=503).

2.3 Variables and Measures

Trained non-clinician interviewers conducted baseline and 6-month follow-up interviews. Baseline questionnaires included the Addiction Severity Index (McLellan et al., 1992) and the Mini-International Neuropsychiatric Interview (MINI), version 5.0 (Sheehan et al., 1998). Demographic variables, collected by the ASI, included gender, age, years of education, legal income, current marital (married/unmarried) and employment status (see Table 1 for categories), and race (white/non-white). ASI drug use variables included number of previous detoxification and drug treatment episodes, recent number of days with drug problems, recent number of days using several drugs (see Table 1 for specific drugs queried) received by illegal (i.e., not prescribed) and legal (i.e., prescribed) means. The MINI determined whether Diagnostic and Statistical Manual of Mental Disorders criteria were met for current major depressive disorder (MDD), generalized anxiety disorder (GAD) and antisocial personality disorder (ASPD). Participants also were asked "Have you ever attempted, but were unable to get into buprenorphine treatment?" A name-generating questionnaire determined the total number of persons in each participant's social network with whom the participant used drugs (drug network), had sex (sex network) and counted on for social support (support network) in the past 6-months. These characteristics listed above served as independent variables for subsequent analyses. In addition, participants were queried about their primary source for buprenorphine.

At the 6-month follow-up visit subjects were asked if they had ever used buprenorphine (non-generic buprenorphine, generic buprenorphine tablets, and buprenorphine and naloxone to get high. If the answer was "yes," frequency of non-prescribed (i.e., diverted) use was determined over the last 6 months and 30 days. The dependent variable analyzed was past 6-month use of diverted buprenorphine (yes/no).

2.4 Analytic Plan

Descriptive statistics are provided on the prevalence, frequency and source of diverted buprenorphine used. Chi-square tests and Wilcoxon rank-sum tests for categorical and continuous variables, respectively, were completed comparing characteristics of those who reported any past 6-month diverted buprenorphine use to those who reported none. As participants were nested within social networks, a variance component model evaluated whether diverted buprenorphine use differed across network components; results showed it did not. Thus, multivariable logistic regression was employed to model the risk factors (see Table 1 for list of independent variables) for any past 6-month diverted buprenorphine use. Variables significant at the $p < 0.10$ level in unadjusted models were entered into the multivariable logistic model one at a time from most to least significant. Only variables significant (i.e., $p < 0.05$) were retained in the final model. STATA, version 12.0 was utilized for all analyses.

3. Results

There were 503 participants at baseline; all reported past 30-day non-medical prescription opioid use "to get high." Ninety-three percent ($n=471$) completed the 6-month follow-up interview and were included in the results reported here. The majority reported using buprenorphine "to get high" at least once in their lifetime (70.1%; $n=330$). Nearly half (46.5%; $n=219$) had used diverted buprenorphine between the baseline and 6-month follow-up visit; most (50.7%; $n=111$) were sporadic users, reporting 1–2 uses over this time period. Daily use was uncommon (9.6%; $n=21$). The median number of days of diverted buprenorphine use in the last 30 days was 1 (interquartile range: 0, 3). The most common primary sources of buprenorphine were: dealer (58.7%) and friends (31.6%), followed by

family (7.3%) and spouse/partner (1.4%). Physicians were rarely (0.9%) a primary source as expected.

Table 1 shows the baseline characteristics among those who did (n=219) and did not (n=252) report any past 6-month use of diverted buprenorphine. Median and interquartile range (IQR) of monthly legal income did not differ (p=0.781) between those who had used diverted buprenorphine [\$500 (IQR: 150, 900)] and those who had not [\$573 (200, 900)]. The only sociodemographic difference between these two groups was being on disability, which decreased the odds of having used diverted buprenorphine compared to the unemployed. Recent use of OxyContin, hydrocodone, methamphetamine and alcohol at baseline increased, while recent use of benzodiazepines decreased, the odds of having used buprenorphine. Injection drug use (IDU) and meeting criteria for GAD at baseline, and attempting but failing to access buprenorphine treatment (p=0.001) also were significant risk factors. Lastly, for each additional member of one's drug network, the odds of using diverted buprenorphine increased 5%.

In the adjusted model (Table 2), six variables emerged as significant predictors of diverted buprenorphine use over the 6-month period. The strongest predictor was attempting but failing to access buprenorphine treatment (Adjusted Odds Ratio [AOR]: 7.31, 95% Confidence Interval [CI]: 2.07, 25.8). Meeting criteria for GAD and recent use of OxyContin, methamphetamine, and alcohol at baseline also were independent risk factors. Recent benzodiazepine use was associated with decreased risk (AOR: 0.53, 95% CI: 0.31, 0.89). Drug network characteristics and being on disability were not significant variables in the adjusted model.

4. Discussion

This study prospectively evaluated risk factors for diverted buprenorphine use in a community-based sample of prescription opioid abusers in the US. Attempting but failing to access buprenorphine treatment was the strongest predictor of diverted buprenorphine use over the 6-month period, increasing the risk 7-fold. Notably, daily use of diverted buprenorphine was uncommon (i.e., n=21 of 471 or 4.5% of the sample).

The finding that the most robust risk factor for buprenorphine use was failing to access legitimate buprenorphine treatment has several important implications. First, it suggests that increasing, not limiting, buprenorphine treatment access may be an effective response to buprenorphine diversion among persons not in treatment. However, it is noteworthy that relatively few participants (n=19) overall attempted to access buprenorphine treatment suggesting a need to understand better why more persons were not attempting to access OBOT. One potential reason is that the cost of OBOT is too high for this sample; monthly legal incomes were approximately \$500 yet the cost of OBOT treatment in Kentucky (KY) is on average \$940/month [e.g., 16 mg/day of buprenorphine and naloxone film costs ~\$540 at KY Walmart stores and the largest provider of OBOT in KY charges ~\$400/month].

Other inventions also are likely needed to mitigate diversion. Dealers and friends were the most common source of diverted buprenorphine in this sample. Friends and family were the most common sources of non-medical use of prescription opioids in the National Survey on Drug Use and Health, but the majority of the friends and family had received them from doctors' prescriptions (SAMHSA, 2009). Thus, it is possible that doctors are an indirect source of diverted buprenorphine and could benefit from continuing educational activities targeted at improving current OBOT practices. For instance, there are data showing that doctors providing OBOT in Appalachia as well as other US regions have limited understanding of the legislation allowing for OBOT, the clinically relevant pharmacology of buprenorphine, and many were not engaging in currently recommended OBOT practice

behaviors (i.e., only 50% of doctors reported routinely inducting patients while in withdrawal; Lofwall et al. 2011). While OBOT physicians are regulated by the Drug Enforcement Administration (DEA), DEA regulation is not aimed at teaching or evaluating for quality OBOT practices. Importantly, quality care OBOT practices have been shown to reduce illicit opioid use and increase drug abstinence (Alford et al., 2011; Fiellin et al., 2008; Parran et al., 2010; Soeffing et al., 2009). Thus, OBOT has the potential to not only reduce buprenorphine diversion and misuse, but also diversion and misuse of the prescription opioid analgesics that have been associated with increasing unintentional overdose deaths (Hall et al., 2008; Paulozzi et al., 2006; Paulozzi and Ryan, 2006).

Recent oxycodone use also was a risk factor for diverted buprenorphine use. Oxycodone abuse is highly prevalent in Appalachia and associated with a more severe profile of drug problems compared to abuse of other prescription opioids (Havens et al., 2007a; Young and Havens, 2012). Thus, it may be that oxycodone use is an indicator of someone with a more severe drug use disorder that is trying to use buprenorphine to relieve withdrawal symptoms and/or treat their addiction as others have reported (Alho et al., 2007; Mitchell et al., 2009; Monte et al., 2009).

Methamphetamine and alcohol use also were predictors of buprenorphine use. This fits a general pattern of poly-drug use in this cohort that is consistent with other studies among rural Appalachian drug users (Shannon et al., 2011; Havens et al., 2007b). Another interesting finding was that those with GAD were more likely to have used diverted buprenorphine. It has been speculated, although not widely accepted or proven, that buprenorphine may be effective in treating anxiety (McCann, 2008), suggesting a self-medication hypothesis to explain the results here. However, this diagnosis was made by the MINI and was not confirmed by a clinical interviewer, which is a study limitation.

Lastly, recent benzodiazepine use is clearly *not* a risk factor for use of diverted buprenorphine in this sample. While it was associated with a lower adjusted odds ratio, it would be incorrect to say that benzodiazepine use is protective because benzodiazepine use was very high (>80%) among those who did and did not use diverted buprenorphine, far greater than other buprenorphine-treated populations (e.g., 46% for Lavie et al., 2009; 32% among those in the Bramness and Kornor, 2007; and 67% for Nielsen et al., 2007). This high prevalence of benzodiazepine use is concerning because the majority of deaths with buprenorphine have occurred when combined with other central nervous system depressants like the benzodiazepines, particularly by the intravenous route (Kintz, 2001).

While lifetime buprenorphine use “to get high” was specifically queried, the motivations for use of past 6-month and recent use of diverted buprenorphine were not systematically queried. Thus, it is possible that persons were using buprenorphine for a variety of reasons such as treating their own addiction and/or opioid withdrawal as others have reported (Alho et al., 2007; Mitchell et al., 2009; Monte et al., 2009). In fact, several subjects said they were using the medication to treat their addiction and withdrawal. Future research should more clearly evaluate motivations at each use along with route of use and the formulation of buprenorphine used (e.g., film, tablet, generic or combination products). Differences in motivations and routes of use of diverted medication may vary depending on the formulation as well as the subject population (e.g., opioid dependent or not). For example, if buprenorphine/naloxone is misused by a parenteral route in an opioid dependent individual, it produces more severe precipitated opioid withdrawal compared to buprenorphine alone (Stoller et al., 2001). However, among recently detoxified and non-dependent opioid abusers, there is no statistically significant difference in self-administration of buprenorphine/naloxone compared to buprenorphine alone (Comer and Cone 2002), and

naloxone does not significantly diminish buprenorphine's opioid agonist effects when administered intranasally or sublingually (Middleton et al. 2011; Strain et al., 2000).

4.2. Conclusions

The inability of nonmedical prescription opioid users to access buprenorphine treatment was the strongest predictor of diverted buprenorphine use. However, relatively few participants attempted to access treatment overall. Therefore, understanding why there were not more attempts to access OBOT and ensuring adequate access to quality, affordable OBOT are logical next steps in attempting to reduce diverted buprenorphine use; such actions also should decrease use of other diverted prescription opioids that have been associated with the US epidemic of unintentional overdose deaths.

Acknowledgments

Role of Funding Source. Funding was provided by NIDA Grant R01-DA024598 (PI: Havens); NIDA had no further role in study design; in the collection, analysis and interpretation of data; in the writing of the report; or in the decision to submit the paper for publication.

The authors would like to acknowledge the field study staff and research study participants.

References

- Alford DP, LaBelle CT, Kretsch N, Bergeron A, Winter M, Botticelli M, Samet JH. Collaborative care of opioid-addicted patients in primary care using buprenorphine: five-year experience. *Arch Intern Med.* 2011; 171:425–431. [PubMed: 21403039]
- Alho H, Sinclair D, Vuori E, Holopainen A. Abuse liability of buprenorphine-naloxone tablets in untreated IV drug users. *Drug Alcohol Depend.* 2007; 88:75–78. [PubMed: 17055191]
- Barry DT, Irwin KS, Jones ES, Becker WC, Tetrault JM, Sullivan LE, Hansen H, O'Connor PG, Schottenfeld RS, Fiellin DA. Integrating buprenorphine treatment into office-based practice: a qualitative study. *J Gen Intern Med.* 2009; 24:218–225. [PubMed: 19089500]
- Bramness JG, Kornor H. Benzodiazepine prescription for patients in opioid maintenance treatment in Norway. *Drug Alcohol Depend.* 2007; 90:203–209. [PubMed: 17478058]
- Cicero TJ, Surratt HL, Inciardi J. Use and misuse of buprenorphine in the management of opioid addiction. *J Opioid Manag.* 2007a; 3:302–308. [PubMed: 18290581]
- Comer SD, Collins ED. Self-administration of intravenous buprenorphine and the buprenorphine/naloxone combination by recently detoxified heroin abusers. *J Pharmacol Exp Ther.* 2002; 303:695–703. [PubMed: 12388653]
- Dart, RC. 5th Annual Scientific Meeting Presentation. Evaluation of ADFs using RADARS system data. 2011. Slides available at <http://www.radars.org/Home2/AnnualMeeting/RADARSSystem2011AnnualMeeting.aspx>
- Dasgupta N, Bailey EJ, Cicero T, Inciardi J, Parrino M, Rosenblum A, Dart RC. Post-marketing surveillance of methadone and buprenorphine in the United States. *Pain Med.* 2010; 11:1078–1091. [PubMed: 20545875]
- Fiellin DA, Moore BA, Sullivan LE, Becker WC, Pantalon MV, Chawarski MC, Barry DT, O'Connor PG, Schottenfeld RS. Long-term treatment with buprenorphine/naloxone in primary care: results at 2–5 years. *Am J Addict.* 2008; 17:116–120. [PubMed: 18393054]
- Hall AJ, Logan JE, Toblin RL, Kaplan JA, Kraner JC, Bixler D, Crosby AE, Paulozzi LJ. Patterns of abuse among unintentional pharmaceutical overdose fatalities. *JAMA.* 2008; 300:2613–2620. [PubMed: 19066381]
- Havens JR, Walker R, Leukefeld CG. Prevalence of opioid analgesic injection among rural nonmedical opioid analgesic users. *Drug Alcohol Depend.* 2007a; 87:98–102. [PubMed: 16959437]

- Havens JR, Oser CB, Leukefeld CG, Webster JM, Martin SS, O'Connell DJ, Surratt HL, Inciardi JA. Differences in prevalence of prescription opiate misuse among rural and urban probationers. *Am J Drug Alcohol Abuse*. 2007b; 33:309–317. [PubMed: 17497554]
- Heckathorn DD. Respondent-driven sampling: a new approach to the study of hidden populations. *Soc Probl*. 1997; 44:174–199.
- Heckathorn DD. Respondent-driven sampling II: deriving valid population estimates from chain-referral samples of hidden populations. *Soc Probl*. 2002; 49:11–34.
- Johanson CE, Arfken CL, di Menza S, Schuster CR. Diversion and abuse of buprenorphine: findings from national surveys of treatment patients and physicians. *Drug Alcohol Depend*. 2012; 120:190–195. [PubMed: 21862241]
- Kintz P. Deaths involving buprenorphine: a compendium of French cases. *Forensic Sci Int*. 2001; 121:65–69. [PubMed: 11516889]
- Lavie E, Fatséas M, Denis C, Auriacombe M. Benzodiazepine use among opiate-dependent subjects in buprenorphine maintenance treatment: correlates of use, abuse and dependence. *Drug Alcohol Depend*. 2009; 99:338–344. [PubMed: 18824311]
- Lofwall MR, Wunsch MJ, Nuzzo PA, Walsh SL. Efficacy of continuing medical education to reduce the risk of buprenorphine diversion. *J Subst Abuse Treat*. 2011; 41:321–29. [PubMed: 21664789]
- McCann DJ. Potential of buprenorphine/naltrexone in treating polydrug addiction and co-occurring psychiatric disorders. *Clin Pharmacol Ther*. 2008; 83:627–630. [PubMed: 18212797]
- McLellan AT, Kushner H, Metzger D, Peters R, Smith I, Grissom G, Pettinati H, Argeriou M. The fifth edition of the Addiction Severity Index. *J Subst Abuse Treat*. 1992; 9:199–213. [PubMed: 1334156]
- Middleton LS, Nuzzo PA, Lofwall MR, Moody DE, Walsh SL. The pharmacodynamic and pharmacokinetic profile of intranasal crushed buprenorphine and buprenorphine/naloxone tablets in opioid abusers. *Addiction*. 2011; 106:1460–1473. [PubMed: 21395892]
- Mitchell S, Kelly S, Brown B, Reisinger S, Peterson J, Ruhf A, Agar M, O'Grady K, Schwartz R. Uses of diverted methadone and buprenorphine by opioid-addicted individuals in Baltimore, Maryland. *Am J Addict*. 2009; 18:346–355. [PubMed: 19874152]
- Monte AA, Mandell T, Wilford BB, Tennyson J, Boyer EW. Diversion of buprenorphine/naloxone coformulated tablets in a region with high prescribing prevalence. *J Addict Dis*. 2009; 28:226–231. [PubMed: 20155591]
- Nielsen S, Dietze P, Lee N, Dunlop A, Taylor D. Concurrent buprenorphine and benzodiazepines use and self-reported opioid toxicity in opioid substitution treatment. *Addiction*. 2007; 102:616–622. [PubMed: 17286641]
- Netherland J, Botsko M, Egan JE, Saxon AJ, Cunningham CO, Finkelstein R, Gourevitch MN, Renner JA, Sohler N, Sullivan LE, Weiss L, Fiellin DA. Factors affecting willingness to provide buprenorphine treatment. *J Subst Abuse Treat*. 2009; 36:244–251. [PubMed: 18715741]
- Parran TV, Adelman CA, Merkin B, Pagano ME, Defranco R, Ionescu RA, Mace AG. Long-term outcomes of office-based buprenorphine/naloxone maintenance therapy. *Drug Alcohol Depend*. 2010; 106:56–60. [PubMed: 19717249]
- Paulozzi LJ, Budnitz DS, Xi Y. Increasing deaths from opioid analgesics in the United States. *Pharmacoepidemiol Drug Saf*. 2006; 15:618–627. [PubMed: 16862602]
- Paulozzi LJ, Ryan GW. Opioid analgesics and rates of fatal drug poisoning in the United States. *Am J Prev Med*. 2006; 31:506–511. [PubMed: 17169712]
- Roux P, Villes V, Blanche J, Bry D, Spire B, Feroni I, Carrieri MP. Buprenorphine in primary care: risk factors for treatment injection and implications for clinical management. *Drug Alcohol Depend*. 2008a; 97:105–113. [PubMed: 18479840]
- Roux P, Villes V, Bry D, Spire B, Feroni I, Marcellin F, Carrieri MP. Buprenorphine sniffing as a response to inadequate care in substituted patients: results from the Subazur survey in south-eastern France. *Addict Behav*. 2008b; 33:1625–1629. [PubMed: 18775604]
- Shannon LM, Havens JR, Oser CB, Crosby R, Leukefeld C. Examining gender differences in substance use and age of first use among rural, Appalachian drug users in Kentucky. *Am J Drug Alcohol Abuse*. 2011; 37:98–104. [PubMed: 21142705]

Drug Alcohol Depend. Author manuscript; available in PMC 2013 December 01.

- Sheehan DV, Lecrubier Y, Sheehan KH, Amorim P, Janavs J, Weiller E, Hergueta T, Baker R, Dunbar GC. The Mini-International Neuropsychiatric Interview (M.I.N.I.): the development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-10. *J Clin Psychiatry*. 1998; 59(Suppl):22–33. [PubMed: 9881538]
- Soeffing JM, Martin LD, Fingerhood MI, Jasinski DR, Rastegar DA. Buprenorphine maintenance treatment in a primary care setting: outcomes at 1 year. *J Subst Abuse Treat*. 2009; 37:426–430. [PubMed: 19553061]
- Stoller KB, Bigelow GE, Walsh SL, Strain EC. Effects of buprenorphine/naloxone in opioid-dependent humans. *Psychopharmacology (Berl)*. 2001; 154:230–242. [PubMed: 11351930]
- Strain EC, Stoller K, Walsh SL, Bigelow GE. Effects of buprenorphine versus buprenorphine/naloxone tablets in non-dependent opioid abusers. *Psychopharmacology (Berl)*. 2000; 148:374–383. [PubMed: 10928310]
- Substance Abuse and Mental Health Service Administration (SAMHSA). [accessed December 15, 2010] Office of Applied Studies, National Survey on Drug Use and Health, Detailed tables 6.47 and 6.48. 2009. @ <http://oas.samhsa.gov/NSDUH/2k9NSDUH/tabs/Sect6peTabs1to54htm#Tab6.48A>
- Valente TW, Gallaher P, Mouttapa M. Using social networks to understand and prevent substance use: a transdisciplinary perspective. *Subst Use Misuse*. 2004; 39:1685–1712. [PubMed: 15587948]
- Vidal-Trecañ G, Varescon I, Nabet N, Boissonnas A. Intravenous use of prescribed sublingual buprenorphine tablets by drug users receiving maintenance therapy in France. *Drug Alcohol Depend*. 2003; 69:175–181. [PubMed: 12609698]
- Wang J, Falck RS, Li L, Rahman A, Carlson RG. Respondent-driven sampling in the recruitment of illicit stimulant drug users in a rural setting: findings and technical issues. *Addict Behav*. 2007; 32:924–937. [PubMed: 16901654]
- Young AM, Havens JR. Transition from first illicit drug use to first injection drug use among rural Appalachian drug users: a cross-sectional comparison and retrospective survival analysis. *Addiction*. 2012; 107:587–596. [PubMed: 21883604]

Table 1

Characteristics of Prescription Opioid Abusers (n=471) who Did and Did Not Use Diverted Buprenorphine over the 6-month Follow-Up Period

Baseline Variables	Bup Use n=219		No Bup Use N=252		p-value	Odds	
	n	%	n	%		Ratio	95% CI
Demographics							
Female	103	47.0	104	41.3	0.209	1.26	0.87, 1.82
White	208	95.0	235	93.2	0.430	1.37	0.62, 2.99
Age in years, med (IQR) *	30 (26, 36)		32 (27, 38)		0.064	0.98	0.96, 1.00
Years of education, med (IQR)	12 (10, 12)		12 (10, 12)		0.426	1.00	0.99, 1.01
Married	54	24.7	66	26.2	0.703	0.92	0.61, 1.39
Employment:							
Unemployed	50	22.8	60	23.8	-	1.00	-
Full-Time	74	33.8	89	35.3	0.189	0.73	0.45, 1.16
Part-Time	66	30.1	58	23.0	0.236	0.73	0.44, 1.22
Disability	22	10.0	38	15.1	0.036	0.51	0.27, 0.95
Student/retired/military	7	3.2	7	2.8	0.819	0.88	0.29, 2.65
Past 30-day drug use, # days							
Legal (prescribed) methadone use	3	1.4	10	4.0	0.086	0.37	0.09, 1.24
Illegal (not prescribed) use of:							
Methadone	139	63.5	145	57.5	0.189	1.28	0.88, 1.86
OxyContin	167	76.3	162	64.3	0.005	1.78	1.19, 2.67
Other oxycodone	165	75.3	178	70.6	0.252	1.27	0.84, 1.91
Hydrocodone	188	86.2	197	78.2	0.024	1.79	1.07, 2.85
Benzodiazepines	178	81.3	222	88.1	0.039	0.57	0.35, 0.97
Alcohol	131	59.8	123	48.8	0.017	1.56	1.08, 2.25
Heroin	8	3.65	12	4.76	0.552	0.76	0.30, 1.89
Cocaine	58	26.5	49	19.4	0.069	1.49	0.97, 2.30
Crack cocaine	25	11.4	29	11.5	0.975	0.99	0.56, 1.74
Methamphetamine	12	5.6	3	1.2	0.008	4.81	1.33, 17.3
Marijuana	142	64.2	146	57.9	0.125	1.34	0.92, 1.95

Baseline Variables	Bup Use n=219		No Bup Use N=252		p-value	Odds Ratio	95% CI
	n	%	n	%			
≥ day of IDU in past 6 months	137	62.6	132	52.4	0.026	1.52	1.05, 2.19
Treatment							
Tried and failed to enter buprenorphine treatment (tx)	16	7.3	3	1.2	0.001	6.54	1.87, 22.7
# Days drug problems, med (IQR)	10 (0, 30)		10 (0, 30)		0.467	1.00	0.99, 1.02
# Previous tx episodes, med (IQR)	1 (0, 2)		1 (0, 2)		0.834	1.01	0.95, 1.09
# Previous of detoxs, med (IQR)	0 (0, 1)		0 (0, 1)		0.543	1.05	0.97, 1.13
DSM-IV Disorders							
Major Depressive Disorder	55	25.1	68	27.0	0.645	0.91	0.60, 1.37
Generalized Anxiety Disorder	79	36.1	61	24.2	0.005	1.77	1.18, 2.63
Antisocial Personality Disorder	76	34.7	72	28.6	0.153	1.33	0.89, 1.96
Social Network							
# Persons in Drug Network	5 (3, 10)		4 (2, 8)		0.031	1.05	1.01, 1.09
# Persons in Sex Network	2 (1, 5)		2 (1, 5)		0.273	1.01	0.97, 1.06
# Persons in Support Network	2 (1, 3)		2 (1, 3)		0.242	1.10	0.95, 1.27

* Med= median and IQR=interquartile range.

Table 2

Factors Predictive of Diverted Buprenorphine Use

	Adjusted Odds Ratio	95% Confidence Interval
Tried and failed to access buprenorphine treatment	7.31	2.07, 25.8
Past 30 Day Use of Non-Prescribed:		
OxyContin®	1.80	1.18, 2.75
Benzodiazepines	0.53	0.31, 0.89
Methamphetamine	4.77	1.30, 17.5
Alcohol	1.60	1.09, 2.36
Generalized Anxiety Disorder	1.69	1.11, 2.56

Use of a 'microecological technique' to study crime incidents around methadone maintenance treatment centers

Susan J. Boyd¹, Li Juan Fang², Deborah R. Medoff², Lisa B. Dixon² & David A. Gorelick³

Department of Psychiatry, University of Maryland School of Medicine, Baltimore, MD, USA,¹ Department of Psychiatry, Division of Services Research, University of Maryland School of Medicine, Baltimore, MD, USA² and Intramural Research Program/National Institute on Drug Abuse/National Institutes of Health, Baltimore, MD, USA³

ABSTRACT

Aims Concern about crime is a significant barrier to the establishment of methadone treatment centers (MTCs). Methadone maintenance reduces crime among those treated, but the relationship between MTCs and neighborhood crime is unknown. We evaluated crime around MTCs. **Setting** Baltimore City, MD, USA. **Participants** We evaluated crime around 13 MTCs and three types of control locations: 13 convenience stores (stores), 13 residential points and 10 general medical hospitals. **Measures** We collected reports of Part 1 crimes from 1 January 1999 to 31 December 2001 from the Baltimore City Police Department. **Design** Crimes and residential point locations were mapped electronically by street address (geocoded), and MTCs, hospitals and stores were mapped by visiting the sites with a global positioning satellite (GPS) locator. Concentric circular 'buffers' were drawn at 25-m intervals up to 300 m around each site. We used Poisson regression to assess the relationship between crime counts (incidents per unit area) and distance from the site. **Findings** There was no significant geographic relationship between crime counts and MTCs or hospitals. A significant negative relationship (parameter estimate -0.3127 , $P < 0.04$) existed around stores in the daytime (7 am–7 pm), indicating higher crime counts closer to the stores. We found a significant positive relationship around residential points during daytime (0.5180 , $P < 0.0001$) and at night (0.3303 , $P < 0.0001$), indicating higher crime counts further away. **Conclusions** Methadone treatment centers, in contrast to convenience stores, are not associated geographically with crime.

Keywords Crime, geocoding, methadone maintenance, neighborhood, spatial analysis.

Correspondence to: Susan J. Boyd, Baltimore VAMC, Department of Psychiatry, 10 N. Greene St., Baltimore, MD 21201, USA. E-mail: susan.boyd@va.gov
Submitted 27 July 2011; initial review completed 15 September 2011; final version accepted 27 February 2012

INTRODUCTION

The aim of this study is to determine whether there is a geographic relationship between methadone treatment centers (MTCs) and neighborhood crime. Methadone maintenance is well established as an effective treatment for opiate dependence [1–3]. Opioid dependence is a global public health problem, with an estimated 24–32 million opioid users (12–14 million heroin users) worldwide in 2009, including 3.1–3.5 million users in Europe [4]. Nevertheless, access to treatment is limited in many communities that oppose the establishment of new methadone maintenance treatment centers (MTCs), due

largely to concerns about crime [5,6]. This resistance exists despite extensive research over several decades, showing that methadone maintenance treatment decreases crime among treated patients. For example, a study of 1075 heroin users found that methadone maintenance plus psychosocial treatment decreased crime, resulting in decreased societal costs [7].

Community concerns about MTCs causing crime reflect a difference between 'clinical' and 'ecological' perspectives. While the clinical perspective has established that successfully treated patients commit fewer crimes [8], there is no empirical evidence on the ecological relationship between MTCs and neighborhood crime. Three

possible relationships could exist, and plausible theories support each relationship. MTCs could decrease neighborhood crime by treating opiate users who live nearby, thereby decreasing their risk of criminal behavior. MTCs could increase crime if they attract untreated or partially treated users into the neighborhood, thereby increasing the local density of people likely to commit crimes [9]. Finally, MTCs could have no crime impact if neighborhood crime relates largely to other factors.

This study addresses the debate by evaluating relevant empirical data with a technique that has not been applied previously to this issue. Previous studies of the geographic (spatial) relationship between locations of substance availability (e.g. alcohol outlets, location of illegal drug possession and sales) and crime have used relationships between locations and crime rates averaged over large areas, typically postal codes or census tracts [9–11]. This study is the first of which we are aware to use a more fine-grained 'microecological' approach. Instead of studying a population of patients or a large geographic area where the MTCs are located, we evaluated crime rates in terms of increasing spatial distance *within* individual MTC neighborhoods.

The study was conducted in Baltimore, MD, USA, an urban environment with a high rate of heroin use [12,13] and high crime rate [14]. The city had 16 methadone treatment centers (MTCs) in operation during the study period. A comparison of crime before and after the establishment of MTCs was not possible, because most of the MTCs in Baltimore had been in operation before the advent of geocodable electronic crime data.

METHODS

Details of the 'microecologic technique' have been published previously [15]. In brief, we obtained a database listing all Federal Bureau of Investigation (FBI) Uniform Crime Report 'Part 1' crimes [homicide, sexual assault, robbery, aggravated assault, burglary, larceny (including theft from a motor vehicle), auto theft and arson] [16] in Baltimore City, MD, from 1 January 1999 to 31 December 2001 from the Baltimore City Police Department. We identified 16 MTCs operating in Baltimore during this study period. One was excluded because it was located on the sixth floor of a general medical hospital, making it impossible to differentiate its crimes from those associated with the hospital. Three of the remaining MTCs were analyzed as one clinic, because their front entrances were within 25 m of each other, making it impossible to analyze their crime data separately. Thus, we included data from 13 MTC's whose characteristics we obtained by telephone survey (Table 1). Of these, eight were on the campus of or near a hospital, but not in the same building as the hospital. Four MTCs offered buprenorphine for

Table 1 Characteristics of 13^a Baltimore City, Maryland methadone maintenance treatment centers (MTCs) operating 1 January 1999 to 31 December 2001.

	<i>Min</i>	<i>Max</i>	<i>Mode</i>	
Opening time	5:30 am	11 am	7 am	
Closing time	4 pm	7:30 pm	6 pm	
	<i>Min</i>	<i>Max</i>	<i>Mean</i>	<i>Median</i>
Daily patient census	55	600	298	300

^aIncludes combined data from three MTCs whose entrances were within 25 m of another MTC (see text).

opioid detoxification or maintenance therapy, in addition to methadone.

To help assess the significance of any relationship between MTCs and crime, we evaluated crime around three types of control sites in Baltimore City, MD. MTCs might have more crime than adjacent locations because of having higher foot traffic. High foot-traffic areas (areas with higher density of people) may have more crime than low foot-traffic areas because offenders are more likely to meet victims/targets in such areas [17]. Therefore, we selected two 'high foot-traffic' sites (general hospitals and convenience stores) and one 'low foot-traffic' site (residential points) as controls. General medical hospitals (10 in operation in Baltimore during the study period) were chosen because they, like MTCs, provide medical care. 'Convenience stores' were those defined as such on the Switchboard.com [18] website. Residential points were defined as addresses in the middle of a block on a small secondary street within a geographic area identified as 'residential' by local zoning maps.

Thirteen convenience stores and 13 residential sites were matched to the 13 MTCs based on 20 relevant census and crime variables (Table 2), which previous factor analytical research has shown can identify neighborhoods with high rates of violent crime [19]. These variables were entered into a factor analysis by Baltimore City Census Block Group (CBG); the analysis was pre-defined to generate a single factor score. Control sites were chosen for each clinic so that the factor scores of their CBGs were closest to the factor score of their matched clinic. Hospitals could not be matched to the MTCs due to the limited number of hospitals (10) available for matching.

Data and geocoding

Crime locations and residential control sites were mapped electronically by 'geocoding' their street addresses using the ArcGIS 9 computer program [20]. Geocoding is a computerized process in which a street address is con-

Table 2 Variables used in the factor analysis for matching census block groups of methadone maintenance treatment centers (MTCs) and control study sites.

Census variables
% Staying at the same house for more than 5 years
Population per square mile
Household size
% Female-headed households
% People with no high school diploma
Per capita income
Median household income
Percent with income below poverty level
% Service workers
% People unemployed
% Households with public assistance income
% Households with no worker
% Non-white
'Racial heterogeneity' (count of different races reported)
% Vacant houses
% Households renting home
Median gross rent
Median value of owner-occupied home
Crime variables
Total crimes in 2000
Total drug-related crimes

verted into a map location (latitude and longitude) [21]. The locations of MTCs, convenience stores and hospitals were determined by visiting the sites and reading the latitude and longitude on a global positioning satellite (GPS) locator. Site visits were necessary in these cases, because street addresses of non-residential sites are sometimes not precise enough to generate an accurate latitude and longitude. For example, convenience stores are sometimes located in large parking lots or malls, along with other stores. In order to maintain the privacy of people living at the residential sites, the locations of the residential sites were found by geocoding, rather than by visiting the site.

'Buffering' sites and counting crimes

We used a 'buffer' methodology to determine the geographic relationship between study sites and neighborhood crime. Concentric circular, non-overlapping, doughnut-shaped buffers were defined at 25-m intervals for up to 300-m radius around each study site. Crimes were counted within each buffer. In order to compare crime quantitatively across buffers of increasing size, the number of crimes was corrected for the area of each buffer to generate crime counts per unit area ('crime counts'). To avoid crime counts <1, the 'unit area' was defined as 1962.5 m² [the size of the smallest (25-m) buffer]. Similar buffer methodologies have been used to study crime around housing projects [22] and supportive housing [23].

Statistical analysis

Poisson regression analyses were used to evaluate the relationship between crime counts and distance from a site. First, a generalized additive model (GAM) with a spline term was used to fit a line to scatter-plots to visualize the data. The GAM graphs indicated that most of the variation in crime incidents was within the first 100 m (first four buffers) of the sites (data not shown). Thus, further data analysis included only crime incidents within 100 m of the study sites. Further analyses used a Poisson distribution and generalized linear model to analyze crime counts around the study sites, generating a parameter estimate (β) through a least-squares analysis. A significant positive β ('positive crime slope') indicates a higher crime rate with increasing distance from the study site, while a significant negative β ('negative crime slope') indicates a higher crime rate closer to the study site. All analyses were performed with SAS version 9.1 [24].

'Within-group' comparisons to evaluate the relationship between crime counts and distance from the site (crime slopes) were performed separately for MTCs, convenience stores, hospitals and residential points. Because crimes can occur at night, when MTCs are closed, we controlled for time of day by analyzing separately crimes occurring during the day (7 a.m.–7 p.m.), the hours when most MTCs are open (Table 1), and at night (7 p.m.–7 a.m.).

RESULTS

There was no significant change in crime counts with increasing distance from MTCs or hospitals (Fig. 1), as indicated by non-significant values for parameter estimates of crime slopes (Table 3). In contrast, there was a significant decrease in crime counts with increasing distance from convenience stores during both daytime and night-time (Fig. 1, Table 3, daytime parameter estimate -0.3127 , $P < 0.04$, night time parameter estimate -0.3235 , $P < 0.0623$). Around residential sites, there was a significant increase in crime counts, with increasing distance from the site during both daytime (0.5180, $P < 0.0001$) and night-time (0.3303, $P < 0.0001$).

DISCUSSION

This study found no significant change in crime counts with increasing distance (up to 100 m) from MTCs, suggesting that MTCs are not a geographic focus for crime. In contrast, there was a significant decline in crime counts with increasing distance from convenience stores and a significant increase in crime counts with increasing

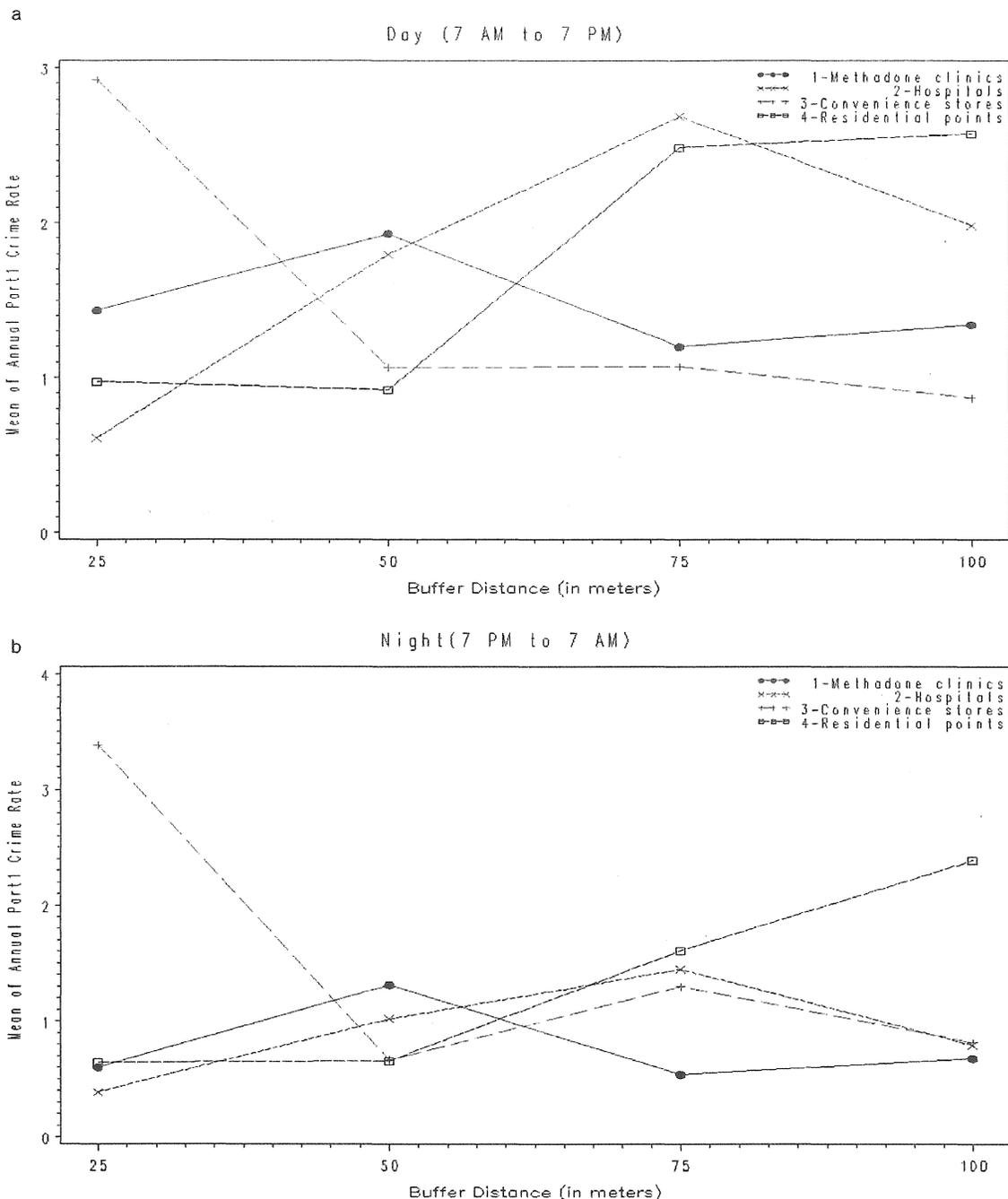


Figure 1 Crime rates around methadone maintenance treatment clinics, general medical hospitals, convenience stores and residential points in Baltimore City, MD (1999–2001). Crimes were all Federal Bureau of Investigation (FBI) Part I crimes [homicide, sexual assault, robbery, aggravated assault, burglary, larceny (including theft from a motor vehicle), auto theft, and arson] reported in Baltimore City, MD between 1 January 1999 and 31 December 2001. Crime rate—crimes per 'unit area' (1962 m², the area of a 25-m circle/buffer). Buffer distance—radius of circular/doughnut-shaped areas defined around study sites. Study sites were 13 methadone maintenance treatment centers (MTCs), 10 general medical hospitals, 13 convenience stores and 13 residential points (residential addresses in the middle of the block on secondary streets). Convenience stores were matched to the MTCs by neighborhood characteristics (see text for details). Mapping of locations was based on street address for crime locations and residential sites and global positioning satellite (GPS) for other sites. (a) Crimes between 7 a.m. and 7 p.m., when MTCs are open. (b) Crimes between 7 p.m. and 7 a.m., when MTCs are closed

Table 3 Poisson regression analysis of the relationship between crime counts^a and distance (≤ 100 m) from study site.

Type of site	Time of day	Parameter estimate ^b	Standard error	Lower confidence limit	Upper confidence limit	Z	P value
MTC ^c [13]	Day ^d	-0.0938	0.2243	-0.5334	0.3457	-0.42	0.6757
	Night ^e	-0.1614	0.2167	-0.5862	0.2634	-0.74	0.4564
Convenience Store [13]	Day	-0.3127	0.1553	-0.6171	-0.0083	-2.01	0.0441
Residential Site [13]	Night	-0.3235	0.1735	-0.6635	0.0166	-1.86	0.0623
General medical hospital [10]	Day	0.3303	0.0511	0.2302	0.4304	6.47	<.0001
	Night	0.518	0.0947	0.3325	0.7035	5.47	<.0001
	Day	0.086	0.1353	-0.1792	0.3511	0.64	0.5251
	Night	-0.056	0.1533	-0.3564	0.2443	-0.37	0.7146

^aCrime count: number of crime incidents per area in each concentric ring at 25-m intervals around the site. ^bParameter estimate: estimated 'crime slope' relating crime counts with distance from study site. Positive parameter estimate indicates increasing crime counts with increasing distance from the site. Negative parameter estimate indicates decreasing crime counts with increasing distance from the site. ^cMTC: methadone maintenance treatment center.

^dDay: 7 a.m.–7 p.m. ^eNight: 7 p.m.–7 a.m. Italics indicate significant results.

distance from the residential sites, indicating that the microecological technique is capable of detecting places that are or are not geographic foci of crime. The observed crime pattern around convenience stores (high foot-traffic areas) and around residential sites (low foot-traffic areas in the middle of small residential blocks) is consistent with the previously shown positive correlation between crime and increased density of people at a site [17]. Overall, the pattern of findings supports the validity and sensitivity of our microecological technique, and strengthens confidence in our primary finding of no significant increase in crime counts closer to MTCs.

An estimated 282 000 Americans were dependent on or abusing heroin and another 1.72 million were dependent on or abusing prescription pain relievers in 2008 [25]. In contrast, only about 265 000 patients were receiving opiate agonist treatment in 1108 US treatment facilities [26]. The European Union had more than 1 million regular opioid users in 2006, but only 25 000 patients receiving methadone maintenance treatment [27]. Thus, there is a public health need for more MTCs to treat the large numbers of people addicted to opiates. Our finding that MTCs are not associated with increases in neighborhood crime addresses a major impediment to the establishment of new clinics, and should lead to greater availability of methadone maintenance treatment for the many people who need it.

This study has several strengths, including the use of a microecological technique that evaluates geographic neighborhoods rather than patient populations, use of control sites matched to the MTCs to minimize confounding by degree of foot traffic and other neighborhood characteristics known to influence crime rates, and the inclusion of data from all but one of the MTCs operating in Baltimore City during the study period.

This study has several limitations. First, the data show substantial variability, as reflected in large confidence

intervals. For example, although methadone clinics and residential points have different crime slopes (different sign for the parameter estimate), there is no significant interaction term between the two groups when they are compared in a between-groups comparison. Secondly, this study has uncertain external validity because it involved a relatively small number [15] of MTCs in a single city. However, there is no obvious manner in which Baltimore City MTCs differ from those in other areas of the United States or abroad, nor is there any reason that the neighborhood factors influencing crime in Baltimore should differ from those elsewhere. Indeed, Baltimore may be an 'ideal' setting for this type of study, given its high rate of heroin use (Baltimore has been called the 'heroin capital' of the United States [12,13]), urban environment and high crime rate [14].

The stigma against methadone maintenance treatment, including concerns about crime, exists throughout the world [28–31], regardless of whether methadone is dispensed in centralized methadone treatment centers or by prescription through community pharmacies. For example, a survey of pharmacists in England found that many expressed concern about shoplifting and aggression if they were to begin to dispense methadone [32]. Residents both in the United Kingdom and Canada voice fears that methadone treatment centers may increase crime, resulting in difficulty opening or keeping open methadone clinics [33–35]. This study provides strong evidence against a major reason for the social stigma concerning methadone maintenance, i.e. concerns about crime. A major issue in the NIMBY ('not in my back yard') phenomenon for MTCs is the need for patients to come in daily for dosing. Buprenorphine, an opioid partial agonist now used in many countries for opioid substitution, can be prescribed by physicians and dispensed for home administration. Because there is no need for patients to come to a specialized clinic for regular dosing, the hope is

that buprenorphine treatment will be less stigmatized and better accepted than methadone treatment.

Finally, a key conceptual issue for any study involving crime is how to quantify crime. Three major parameters have been used to measure crime in social science studies, each with its own advantages and disadvantages: crime incidents (used in this study), arrests and 911 calls. Crime incidents, being generated from complaints of crime, are not subject to policy changes in police enforcement, unlike arrest data. However, incident data have the disadvantage of not recording 'victimless' crimes, such as many drug crimes. Databases of 911 calls have the disadvantage of containing a large number of 'unfounded' events; that is, when the police arrive at the scene of the call, there is no evidence of the reported crime. However, 911 databases may be a more sensitive measure of community concerns about crime.

Overall, our data show that MTCs are not a geographic focus of crime, thus providing both strong evidence to alleviate neighborhood concerns about the establishment and operation of MTCs and quantitative information to combat the stigma of methadone substitution treatment. As more MTCs open and more geocodable crime data become available, future research can attempt to confirm and expand our findings using before-and-after designs and different types of crime data.

CONCLUSION

This study found no significant increase in crime around MTCs, while finding the expected significant increase around convenience stores, which also have high foot traffic. These results do not support the common neighborhood concern of MTCs as geographic foci of crime, and may ease the establishment of new MTCs. Studies using the microecological technique may inform more clearly the social and political debate around the siting of MTCs.

Declarations of interest

SB is Medical Director of the Baltimore Veterans Affairs Medical Center Opiate Agonist Treatment Program. Otherwise, the authors have no conflicts of interest in relation to this study or connection with the tobacco, alcohol, pharmaceutical or gaming industries. There are no contractual constraints on publishing this study.

Acknowledgements

This work was supported by the Substance Abuse Policy Research Program, Robert Wood Johnson Foundation, the Center for Substance Abuse Treatment/ Substance Abuse and Mental Health Services Adminis-

tration and the Intramural Research Program of the National Institutes of Health/National Institute on Drug Abuse.

References

1. Mattick R. P., Breen C., Kimber J., Davoli M. *Methadone maintenance therapy versus no opioid replacement therapy for opioid dependence*. 2009. Available at: <http://onlinelibrary.wiley.com/doi/10.1002/14651914.cdr002209> (accessed 21 October 2010) (archived by WebCite® at <http://www.webcitation.org/5tefnHjIW>).
2. Mattick R. P., Kimber J., Breen C., Davoli M. *Buprenorphine maintenance versus placebo or methadone maintenance for opioid dependence*. 2008. Available at: <http://onlinelibrary.wiley.com/doi/10.1002/14651914.cdr002207> (accessed 21 October 2010) (archived by WebCite® at <http://www.webcitation.org/5teeni4TE>).
3. World Health Organization. *Guidelines for the psychosocially assisted pharmacological treatment of opioid dependence*. World Health Organization 2009. Available at: http://whqlibdoc.who.int/publications/2009/9789241547543_eng.pdf (accessed 18 January 2012) (archived by WebCite® at <http://www.webcitation.org/64mSjzTEy>).
4. United Nations Office on Drugs and Crime. *World Drug Report 2011*. United Nations Office on Drugs and Crime 2011. Available at: http://www.unodc.org/documents/data-and-analysis/WDR2011/World_Drug_Report_2011_ebook.pdf (accessed 18 January 2012) (archived by WebCite® at <http://www.webcitation.org/64mTZx3ly>).
5. de Nike L. Impact of Awakenings center debated: owners say coffee shop, methadone don't mix. *Towson Times com* 2003 16 July. Available at: <http://www.explorebaltimorecounty.com/news/6021499/impact-awakenings-center-debated/> (accessed 14 August 2010) (archived by WebCite® at <http://www.webcitation.org/5ryuRjxUx>).
6. Spencer C. C. Neighbors don't welcome methadone clinic: operation PAR plans to move its facility to a residential area. *St Petersburg Times* (web version) 2007 28 June. Available at: http://www.sptimes.com/2007/06/28/Pasco/Neighbors_don_t_welco.shtml (accessed 16 August 2010) (archived by WebCite at <http://www.webcitation.org/5s2HSLyZm>).
7. Healey A., Knapp M., Marsden J., Gossop M., Stewart D. Criminal outcomes and costs of treatment services for injecting and non-injecting heroin users: evidence from a national prospective cohort survey. *J Health Serv Res Policy* 2003; 8: 134-41.
8. Teeson M., Ross J., Darke S., Lynskey M., Ali R., Ritter A. C. R. One year outcomes for heroin dependence: findings from the Australian Treatment Outcome Study (ATOS). *Drug Alcohol Depend* 2006; 83: 174-80.
9. Gorman D. M., Zhu L., Horel S. Drug 'hot-spots', alcohol availability and violence. *Drug Alcohol Rev* 2005; 24: 507-13.
10. Livingston M. Alcohol outlet density and assault: a spatial analysis. *Addiction* 2008; 103: 619-28.
11. Gruenewald P. J., Freisthler B., Remer L., Lascala E. A., Trepo A. Ecological models of alcohol outlets and violent assaults: crime potentials and geospatial analysis. *Addiction* 2006; 101: 666-77.

12. Lambidakis S. Baltimore Crowned Heroin Capital. *CBS News* 2009 11 February. Available at: <http://www.cbsnews.com/stories/2000/07/30/national/main220037.shtml> (accessed 4 January 2012) (archived by WebCite at <http://www.webcitation.org/64Rnvv1tN>).
13. National Drug Intelligence Center. Maryland Drug Threat Assessment. US Department of Justice 2002 1 August. Available at: <http://www.justice.gov/ndic/pubs1/1827/1827p.pdf> (accessed 4 January 2012) (archived by WebCite at <http://www.webcitation.org/64Rof8eLT>).
14. Kurtzleben D. The 11 Most Dangerous Cities. *US News and World Report* 2011 16 February. Available at: <http://www.usnews.com/news/articles/2011/02/16/the-11-most-dangerous-cities> (accessed 4 January 2012) (archived by WebCite at <http://www.webcitation.org/64RrEDzvH>).
15. Boyd S. J., Armstrong K. M., Fang L. J., Medoff D. R., Dixon L. B., Gorelick D. A. Use of a 'microecologic technique' to study crime around substance abuse treatment centers. *Soc Sci Comput Rev* 2007; 25: 163–73.
16. Federal Bureau of Investigation. *Uniform Crime Reporting Handbook*. Clarksburg, WV: Federal Bureau of Investigation; 2004. Available at: <http://www.fbi.gov/ucr/handbook/ucrhandbook04.pdf> (accessed 23 August 2010) (archived by WebCite at <http://www.webcitation.org/5sCvnixU1>).
17. Sherman L. W. Hot spots of crime and criminal careers of places. In: Eck J. E., Weisburd D., editors. *Crime and Place*. Monsey, NY: Criminal Justice Press; 1995, p. 35–52.
18. Switchboard.com. *InfoSpace, Inc.* 2006. Available at: www.switchboard.com (accessed 21 October 2010) (archived by WebCite at <http://www.webcitation.org/5ryx1XdLp>).
19. Harries K. Social stress and trauma: synthesis and spatial analysis. *Soc Sci Med* 1997; 45: 1251–64.
20. ARC GIS 9.0 [computer program]. Redlands, CA: Environmental Systems Research Institute, Inc.; 1999.
21. Harries K. *Mapping Crime: Principle and Practice*. Washington, DC: US Department of Justice, Office of Justice Programs; 1999. Available at: <http://www.ncjrs.gov/pdffiles1/nij/178919.pdf>. (accessed 23 August 2010) (archived by WebCite at <http://www.webcitation.org/5sCwC3TDM>).
22. Hyatt R. A., Holzman H. R. *Guidebook for Measuring Crime in Public Housing with Geographic Information Systems*. Washington, DC: US Department of Housing and Urban Development; 2006. Available at: <http://www.huduser.org/portal/publications/pubasst/gis.html> (accessed 5 October 2010) (archived by WebCite at <http://www.webcitation.org/5tGC2nN0m>).
23. Galster G., Pettit K., Tatian P. A., Santiago A. M., Newman S. J., Institute T. U. *The Impacts of Supportive Housing on Neighborhoods and Neighbors*. Washington, DC: US Department of Housing and Urban Development; 2000. Available at: <http://www.huduser.org/portal/publications/suppsvcs/support.html> (accessed 5 October 2010) (archived by WebCite at <http://www.webcitation.org/5tGCX13JW>).
24. SAS Institute, Inc. SAS 9.1 [computer program]. Cary, NC: SAS Institute, Inc.; 2002.
25. Office of Applied Studies (OAS). *Results from the 2008 National Survey on Drug Use and Health: Detailed Tables*. Rockville, MD: Substance Abuse and Mental Health Services Administration (SAMHSA); 2009. Report no.: DHHS Publication no. SMA 09-4434. Available at: <http://oas.samhsa.gov/NSDUH/2k8nsduh/tabs/Cover.pdf> (accessed 7 July 2011) (archived by WebCite at <http://www.webcitation.org/600LtwSsq>).
26. Office of Applied Studies (OAS). *National Survey of Substance Abuse Treatment Services (N-SSATS): Data on Substance Abuse Treatment Facilities*. Rockville, MD: Substance Abuse and Mental Health Services Administration (SAMHSA); 2007. Report no.: DHHS Publication no. (SMA) 08-4348. Available at: <http://www.dasis.samhsa.gov/07nssats/nssats2k7web.pdf> (accessed 5 October 2010) (archived by WebCite at <http://www.webcitation.org/5tGEnSVX8>).
27. European Monitoring Centre for Drugs and Drug Addiction. *2011 Annual report on the state of the drugs problem in Europe*. European Monitoring Centre for Drugs and Drug Addiction 2011. Available at: <http://www.emcdda.europa.eu/publications/annual-report/2011> (accessed 18 January 2012) (archived by WebCite at <http://www.webcitation.org/64mW65roP>).
28. Khan U. Beyond Nimbyism: urban conflict resolution in Swiss drug policies. In: Khan U., editor. *Participation beyond the Ballot Box: European Case Studies in State–Citizen Political Dialogue*. London, UK: United College of London (UCL) Press; 1999, p. 43.
29. Miller P., Martin A., Walker J., Strang J., Lintzeris N. An investigation of the community impact of a medically supervised injectable maintenance clinic. National Addiction Centre, South London and Maudsley Trust 2012. Available at: <http://www.actiononaddiction.org.uk/Documents/Community-Impact-Study.aspx> (accessed 5 January 2012) (archived by WebCite at <http://www.webcitation.org/64SfB51Sy>).
30. Hasiuk M. Vancouver methadone pharmacies create crime and misery with coffee: College of Pharmacists unable or unwilling to control pharmacies in Downtown Eastside. *Vancouver Courier* 2010 November 2. Available at: <http://www.vancourier.com/Vancouver+methadone+pharmacies+create+crime+miser+y+with+coffee/3765105/story.html> (accessed 9 January 2012) (archived by WebCite at <http://www.webcitation.org/64ZYco4c1>).
31. Anonymous. Residents' fears over late-night pharmacy. *Hull Daily Mail* 2011 3 November. Available at: <http://www.thisishullandeastriding.co.uk/Residents-fears-late-night-pharmacy/story-13740801-detail/story.html> (accessed 29 November 2011) (archived by WebCite at <http://www.webcitation.org/63Yzay6JW>).
32. Sheridan J., Manning V., Ridge G., Mayet S., Strang J. Community pharmacies and the provision of opioid substitution services for drug misusers: changes in activity and attitudes of community pharmacists across England 1995–2005. *Addiction* 2007; 102: 1824–30.
33. Smith C. Socio-spatial stigmatization and the contested space of addiction treatment: remapping strategies of opposition to the disorder of drugs. *Soc Sci Med* 2010; 70: 859–66.
34. Anonymous. Methadone clinic for Wexford town. *Wexford Echo* 2010 18 February. Available at: <http://www.wexfordecho.ie/news/mhojfkfidql/> (accessed 29 November 2011) (archived by WebCite at <http://www.webcitation.org/63Z03ffxf>).
35. Platt M. Helping addicts get clean in methadone clinics is tough at the best of times but harder still with NIMBY backlash. *Calgary Sun* 2012. Available at: <http://www.calgarysun.com/news/columnists/michael+platt/2009/06/29/9967291-sun.html> (accessed 10 January 2012) (archived by WebCite at <http://www.webcitation.org/64a7g72Pm>).



Mortality among clients of a state-wide opioid pharmacotherapy program over 20 years: Risk factors and lives saved[☆]

Louisa Degenhardt^{a,*}, Deborah Randall^a, Wayne Hall^b, Matthew Law^c, Tony Butler^d, Lucy Burns^a

^a National Drug and Alcohol Research Centre, University of NSW, Sydney, NSW 2052, Australia

^b School of Population Health, University of Queensland, Herston, QLD 4008, Australia

^c National Centre in HIV Epidemiology and Clinical Research, The University of New South Wales, 376 Victoria Street, Darlinghurst, NSW 2010, Australia

^d National Drug Research Institute, Curtin University of Technology, Level 2, 10 Selby Street, Shenton Park, WA 6008, Australia

ARTICLE INFO

Article history:

Received 24 March 2009

Received in revised form 11 May 2009

Accepted 14 May 2009

Available online 15 July 2009

Keywords:

Methadone maintenance

Buprenorphine

Mortality

Causes of death

Data linkage

Opioid dependence

ABSTRACT

Background: The small size of previous studies of mortality in opioid dependent people has prevented an assessment of the extent to which elevated mortality risks are consistent across time, clinical and/or patient groups. The current study examines reductions in mortality related to treatment in an entire treatment population.

Methods: Data from the New South Wales (NSW) Pharmaceutical Drugs of Addiction System, recording every "authority to dispense" methadone or buprenorphine as opioid replacement therapy, 1985–2006, was linked with data from the National Deaths Index, a record of all deaths in Australia. Crude mortality rates and standardized mortality ratios were calculated according to age, sex, calendar year, period in- or out-of-treatment, medication type, previous treatment exposure and cause of death.

Results: Mortality among 42,676 people entering opioid pharmacotherapy was elevated compared to age and sex peers. Drug overdose and trauma were the major contributors. Mortality was higher out of treatment, particularly during the first weeks, and it was elevated during induction onto methadone but not buprenorphine. Mortality during these risky periods changed across time and treatment episodes. Overall, mortality was similarly reduced (compared to out-of-treatment) whether patients were receiving methadone or buprenorphine. It was estimated that the program produced a 29% reduction in mortality across the entire cohort.

Conclusions: Mortality among treatment-seeking opioid-dependent persons is dynamic across time, patient and treatment variables. The comparative reduction in mortality during buprenorphine induction may be offset by the increased risk of longer out-of-treatment time periods. Despite periods of elevated risk, this large-scale provision of pharmacotherapy is estimated to have resulted in significant reductions in mortality.

© 2009 Elsevier Ireland Ltd. All rights reserved.

1. Introduction

Illicit opioid use, especially heroin injection, has caused significant personal and public health problems in many countries across the globe (United Nations Office on Drugs and Crime, 2008). Apart from the burden to users, their families and the broader community, opioid dependence increases the risk of premature mortality (Darke et al., 2006). This elevated risk is concentrated across several causes of death: accidental drug overdose, suicide, trauma (e.g. motor vehicle accidents, homicide or other injuries), and HIV (in countries where HIV is prevalent among people

who inject drugs) (Degenhardt et al., 2004, 2006; Darke et al., 2006).

The mainstays of treatment for opioid dependence are pharmacological maintenance on methadone and buprenorphine, both of which are listed on the World Health Organization's (WHO) *Model List of Essential Medicines* (World Health Organization, 2005) for this indication. Methadone is an orally administered opioid agonist with a half-life of 24–36 h. Multiple randomized controlled trials have found that methadone treatment decreases illicit opioid use, improves social functioning, decreases offending behaviors and improves health (Ward et al., 1998; Mattick et al., 2003).

The need for supervised daily dosing of methadone in a defined treatment setting, and evidence of increase overdose death on induction into treatment prompted the search for alternative pharmacological treatment options (Mattick et al., 2001). As a partial agonist, buprenorphine produces less depression of respiration and consciousness than methadone, thereby reducing the overdose risk.

[☆] Additional background materials and data analyses are provided in six appendices available with the online version of this article at doi:xxxxxxx.

* Corresponding author. Tel.: +61 2 9385 0230; fax: +61 2 9385 0222.

E-mail address: l.degenhardt@unsw.edu.au (L. Degenhardt).

Buprenorphine is longer acting than methadone, allowing for less than daily dosing.

Opioid pharmacotherapy is not without its own risks (Ward et al., 1998), nor does it completely remove the excess mortality risks that opioid dependent persons are known to face (Darke et al., 2006). Work has shown, for example, high mortality during the period of induction onto methadone (Caglehorn, 1998; Buster et al., 2002). More recent work has found that induction onto methadone, and cessation, carry elevated mortality risks (Caglehorn and Drummer, 1999; Buster et al., 2002; Brugal et al., 2005).

The small sample size of these studies has prevented an assessment of the extent to which these elevated risks are consistent across time and/or patient groups. Few existing examinations have had sufficient power to examine differences in risk across time and patient level variables. Further, these studies have typically focused on treatment groups rather than across entire treatment programs. No estimates exist of the size of reductions in mortality related to treatment for an entire treatment population while also considering other important predictors of mortality risk.

New South Wales (NSW) is the most populous State of Australia, with approximately six million residents. It has had an expanding and expansive opioid replacement program in place for almost thirty years. Over 40,000 people have entered treatment since 1985 (Burns et al., 2009). The size of this entire treatment population allows for an examination of important questions of clinical and population health interest. The aims of this study were to:

- (i) Estimate overall mortality for all persons entering opioid pharmacotherapy between 1985 and 2006, by demographic and treatment variables;
- (ii) Examine whether demographic or treatment variables were related to mortality levels during and following cessation of treatment;
- (iii) Estimate mortality risk, according to specific causes of death, during time within treatment and following cessation of treatment;
- (iv) Estimate the number of lives that may have been saved by the provision of methadone and buprenorphine in NSW over this period;
- (v) Consider the estimated lives saved from improved clinical delivery of these treatments.

2. Methods

2.1. Sample

The NSW Pharmaceutical Drugs of Addiction System (PHDAS) is a database that records when an authority to dispense methadone or buprenorphine in NSW as an opioid replacement therapy to a particular person has been approved by the NSW Health Department. This study examined unit record data from the PHDAS database on all persons entering pharmacotherapy treatment between 1985 and 2006.

Exclusions from the analysis included: those who did not commence treatment; those in temporary programs, such as interstate clients; and buprenorphine clinical trial participants, as they were not necessarily given buprenorphine during the trial.

There were multiple treatment episodes for many individuals and these were sometimes continuous. Previous research using the PHDAS data defined a new treatment episode as one coming 7 or more days after a previous episode had finished. We adopted this definition following consultation with experts in clinical research and practice (Degenhardt et al., 2005). A change in the medication prescribed (methadone or buprenorphine) was considered a continuous episode if there was less than 7 days between one episode end and the next episode start.

We adopted the same definitions – treating the 6 days following a treatment program as part of that program – when allocating deaths to in-treatment or out-of-treatment time periods. There is a potential bias in this methodology to allocate deaths to the treatment period that actually occurred after leaving treatment, but any such errors bias in-treatment mortality *upwards* and out-of-treatment mortality *downwards*, resulting in conservative estimates of mortality reduction during treatment.

All deaths in Australia are coded by expert clinical coders at the Australian Bureau of Statistics (ABS) on the basis of information contained in the death certificate and

in some cases from coronial files. For deaths occurring between 1985 and 1996, causes of death were coded according to ICD-9 (World Health Organization, 1977). For deaths occurring between 1997 and 2006, causes of death were coded using ICD-10 codes (World Health Organization, 1993). Only underlying causes were coded in the 1985–1996 period, defined as the “disease or injury which initiated the train of morbid events leading directly to death, or the circumstances of the accident or violence which produced the fatal injury” (Australian Bureau of Statistics, 2007); but up to 19 contributing causes of death were coded from 1997 onwards. Only underlying causes were examined in this study (apart from opioid deaths from 1997 onwards that were cross-classified with particular substance codes). These were grouped into related conditions according to ICD codes based on published expert consensus statements or health department protocols (see Web Appendix 1 and also (Randall et al., 2009) for groupings and sources for definitions).

2.2. Data linkage

Linkage with mortality data from the National Deaths Index was performed by staff at the Australian Institute of Health and Welfare (AIHW) using an in-house probabilistic record linkage program. Variables used for matching purposes included full name, date of birth, sex, date and state of last known contact. A linked data set was forwarded to the investigators on completion of linkage.

2.3. Data analysis

The crude mortality rates (CMRs) were calculated by summing the person-years contributed by each participant, by age, sex, calendar year and treatment time period, summing the numbers of deaths by the same groups, and calculating a rate per 1000 person-years. Crude rate ratios (RRs) were calculated by dividing one mortality rate by another.

Indirect standardized mortality ratios (SMR) were calculated by dividing the observed deaths in the cohort by the expected deaths based on the NSW population mortality rates by year, sex and age group.

In this paper, we have used stratified analyses of SMRs, which allowed us to compare groups, while simultaneously comparing mortality rates against the general population of the same age and sex. We also used Poisson regression to examine predictors of mortality during two time periods: 1985–2000 (methadone only used); and 2001–2006 (methadone and buprenorphine). The results of these regressions have not been included in this paper; the findings were consistent with the results presented in the body of this paper (interested readers can find details of the models at Web Appendix 2). The observed out-of-treatment CMR was applied to the total person-years in the cohort, to provide an estimate of the reductions in mortality resulting from the pharmacotherapy program. This assumes that the mortality reductions were due to treatment. It is nonetheless a conservative estimate because it includes persons who did not die during their first (or subsequent) treatment episode, hence underestimates the mortality rate among untreated opioid dependent persons. Estimated numbers of deaths that might have been averted if the elevated mortality during induction did not exist were made by applying the CMR for the remainder of the treatment period to the total person-years during induction (separately for methadone and buprenorphine). Analyses were conducted in SAS V9.1.3 (SAS Institute Inc., Cary, NC, USA) and Stata V9.2 (StataCorp LP, College Station, TX, USA).

2.4. Ethics

Ethics approval to conduct this study was received from all relevant institutional Human Research Ethics Committees.

3. Results

3.1. Overall results

Over the study period 42,676 clients entered treatment for a total of 425,998 person-years of follow-up (PY; median 9.2 years). The median episode length was 198 days, and participants entered into an average of 2.5 treatment episodes. Further details of treatment retention and re-entry are presented elsewhere (Burns et al., 2009) (see also Web Appendix 3).

During the follow-up period there were 3803 deaths, with an overall CMR of 8.9 deaths per 1000 PY (95% CI: 8.6–9.2; Table 1). CMRs were higher in males than females, and among older clients. The pattern of SMRs was reversed, with a greater excess mortality among females, and a greater excess mortality among younger clients. Mortality rates (both CMRs and SMRs) increased over time until 1995–2000, and fell in 2001–2006 (Table 1, Fig. 1).

The overall in-treatment SMR was 4.5 (95% CI 4.3, 4.8), compared with an out-of-treatment SMR of 8.0 (95% CI 7.7, 8.3). The

Table 1

Crude mortality rates and standardized mortality ratios according to demographic and treatment characteristics among 42,676 NSW opioid pharmacotherapy treatment entrants, 1985–2006.

	Person-years	Total deaths	CMR per 1000 person-years	95% CI	SMR	95% CI
Sex						
Males	276095	2835	10.3	(9.9–10.7)	5.9	(5.7–6.1)
Females	149903	968	6.5	(6.1–6.9)	8.7	(8.1–9.2)
Age group						
Less than 20 years	4735	30	6.3	(4.3–9.0)	12.1	(8.2–17.3)
20–29 years	123143	932	7.6	(7.1–8.1)	8.7	(8.1–9.2)
30–39 years	182329	1486	8.2	(7.7–8.6)	7.3	(7.0–7.7)
40+ years	115791	1355	11.7	(11.1–12.3)	4.8	(4.6–5.1)
Calendar year						
1985–1989	21375	128	6.0	(5.0–7.1)	5.3	(4.4–6.3)
1990–1994	59666	506	8.5	(7.8–9.3)	7.1	(6.5–7.7)
1995–2000	136301	1525	11.2	(10.6–11.8)	8.6	(8.2–9.1)
2001–2006	208656	1644	7.9	(7.5–8.3)	6.2	(5.9–6.5)
Treatment period						
First week in treatment	2178	86	39.5	(31.6–48.8)	35.4	(28.3–43.7)
Second week in treatment	2059	35	17.0	(11.8–23.6)	15.2	(10.6–21.2)
Remainder in treatment	198100	1102	5.6	(5.2–5.9)	4.1	(3.9–4.4)
Overall in treatment	202337	1223	6.0	(5.7–6.4)	4.5	(4.3–4.8)
First week out of treatment	1666	29	17.4	(11.7–25.0)	15.3	(10.2–21.9)
Second week out of treatment	1591	32	20.1	(13.8–28.4)	17.6	(12.0–24.8)
Remainder out of treatment	220404	2519	11.4	(11.0–11.9)	7.9	(7.6–8.2)
Overall out of treatment	223661	2580	11.5	(11.1–12.0)	8.0	(7.7–8.3)
Medication type¹						
Receiving methadone (1985–2000)	111538	648	5.8	(5.4–6.3)	4.6	(4.2–4.9)
Receiving methadone (starting 2001–2006)	12877	67	5.2	(4.0–6.6)	5.9	(4.5–7.4)
Receiving buprenorphine (starting 2001–2006)	4702	21	4.5	(2.8–6.8)	4.6	(2.8–7.0)
First medication type (2001–2006)						
First given methadone (2001–2006)	21974	148	6.7	(5.7–7.9)	7.3	(6.2–8.6)
First given buprenorphine (2001–2006)	12863	88	6.8	(5.5–8.4)	7.3	(5.8–9.0)
Total	425998	3803	8.9	(8.6–9.2)	6.4	(6.2–6.6)

Person-years do not sum to total as this refers only to time when receiving medications, and 2001–2006 figures are just for those who started treatment 2001 onwards.

rate ratio for the out-of-treatment CMR over the in-treatment CMR showed significantly increased mortality out-of-treatment (RR 1.9, 95% CI 1.8–2.0, $p < .001$). Analysis of mortality by time in treatment revealed that the highest mortality risk was during the first week, with 39.5 deaths per 1000 years of follow up (95% CI 31.6, 48.8), 35.4 times those expected in the general population of the same age and sex (95% CI 28.3, 43.7). Mortality dropped sharply during the second treatment week, and was significantly lower for the remainder of the treatment period compared with the second week (5.6 deaths per 1000 person-years; 95% CI 5.2, 5.9; rate ratio (RR) 0.33, 95% CI 0.23–0.47, $p < .001$). The latter rate was still four times higher than that in the general population (SMR 4.1, 95% CI 3.9, 4.4). Comparison of in-treatment mortality levels among clients entering the

program from 2001 onwards prescribed methadone and buprenorphine in the 2001–2006 period revealed no significant differences between the two (RR 0.86, 95% CI, 0.50–1.42, $p = .552$), and there was no difference in the overall SMR for those first given methadone (7.3, 95% CI, 6.2–8.6) in comparison with those first give buprenorphine (7.3, 95% CI, 5.8–9.0) from 2001 to 2006 (Table 1).

3.2. Treatment induction and cessation

A number of interactions existed between treatment variables and mortality risk. The analysis comparing induction on buprenorphine and methadone was restricted to those who entered the program from 2001 onwards. Only one death was estimated to

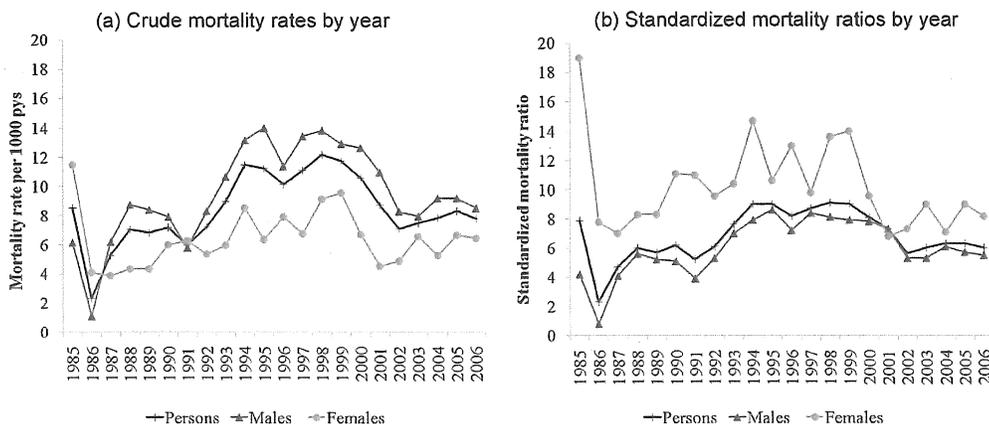


Fig. 1. Mortality levels shown as crude mortality rates per 1000 person-years (Left Panel), and standardized mortality ratios (Right Panel) among opioid pharmacotherapy entrants in New South Wales, 1985–2006.

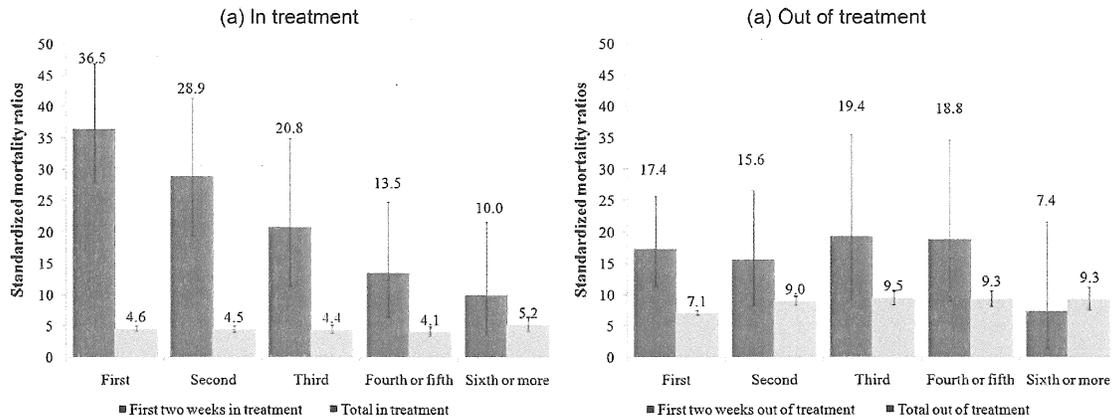


Fig. 2. Interaction between prior treatment and mortality risk (standardized mortality ratios) according to treatment period. In treatment shown in the *Left Panel*; out of treatment shown in the *Right Panel*.

have occurred during induction onto buprenorphine (CMR 2.5; 95% CI: 0.1–13.7); whereas the CMR for those being inducted onto methadone during 2001–2006 was 26.3 per 1000 PY (95% CI: 13.6–45.9) (RR 0.09, 95% CI 0.002–0.63, $p = .004$). The majority of induction deaths occurred in the first two episodes (one out of one for buprenorphine and six out of seven for methadone). No significant differences in mortality risk existed immediately following cessation of buprenorphine versus methadone (RR 5.60, 95% CI: 0.63–264.75, $p = .096$) (Web Appendix 4).

The excess mortality seen in the first two weeks of treatment from 1985 to 2006 was strongly related to prior treatment exposure: during the first treatment episode, the SMR during the two week induction period was 36.5 (95% CI 27.9, 46.9), but it decreased with successive episodes to 10.0 (95% CI: 3.7, 21.7; Fig. 2; see also Web Appendix 4) for a client entering their sixth (or later) treatment episode. This was a significant trend in the SMRs (RR 0.73, 95% CI: 0.63, 0.84, $p < .001$). Mortality during treatment overall, however, was unrelated to prior treatment exposure (RR 1.00, 95% CI: 0.96, 1.04, $p = .971$; Fig. 2a). Mortality in the two weeks following cessation of treatment was no different depending on the number of prior treatment episodes (RR 0.93, 95% CI: 0.77, 1.12, $p = 0.450$; Fig. 2b).

Mortality risk during treatment induction was associated with calendar year (Fig. 3a) with the highest risk in the 1990–1994 period, where the SMR was 52.9 (95% CI: 37.6, 72.3). The excess mortality decreased over time, to 16.5 (95% CI: 10.9, 24.0) in 2001–2006.

Mortality immediately following treatment cessation was consistently elevated across time compared to the general population.

Overall, the excess mortality was highest for those out of treatment during the 1995–2000 period (Fig. 3b).

3.3. Causes of death

The lower average mortality observed during treatment was found in a limited number of causes of death (Fig. 4a). The in-treatment period was associated with lower mortality from opioid and other drug overdoses, and deaths due to unintentional injury and suicide (Fig. 4a; see also Web Appendix 5). HIV was an uncommon cause of death among the cohort, whether in or out of treatment.

The interaction between treatment period and mortality reflected the effects of specific causes of death. During the first two weeks in treatment, mortality due to opioids and other drugs and unintentional injury and suicide, were all at *much* higher levels than those seen for any other period (in or out of treatment) (Fig. 4b). The mortality risk for these same causes was markedly elevated in the first two weeks out of treatment.

Estimated reduction in mortality among this cohort associated with provision of opioid pharmacotherapy, 1985–2006.

Applying the overall out-of-treatment mortality rate (11.5/1000 PYs) to the total person-years (425,998), it was estimated that 1111 additional deaths would have occurred during the study period if the treatment programme, as implemented, had not existed, an increase in 29% in overall mortality among this group.

Estimates were also made of the number of deaths that might have been averted if the risk during induction (28.6/1000 PYs) was

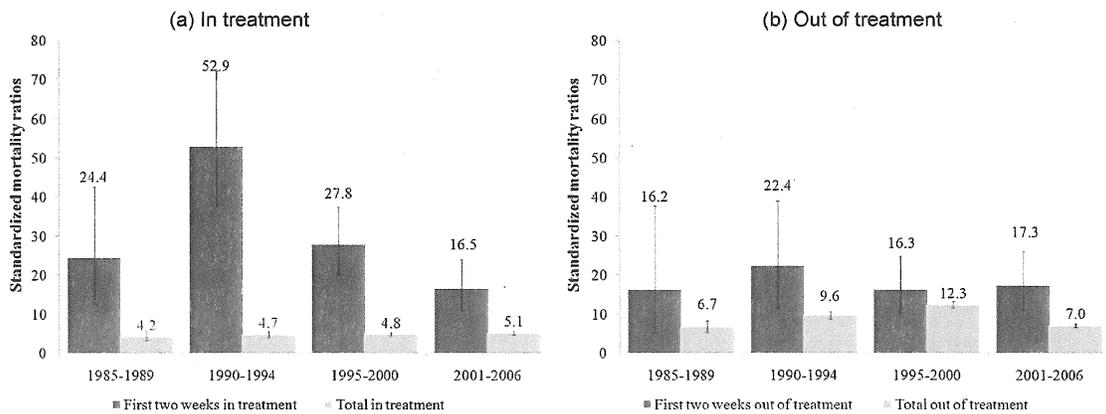


Fig. 3. Interaction between calendar year and mortality risk (standardized mortality ratios) according to treatment period. In treatment shown in the *Left Panel*; out of treatment shown in the *Right Panel*.

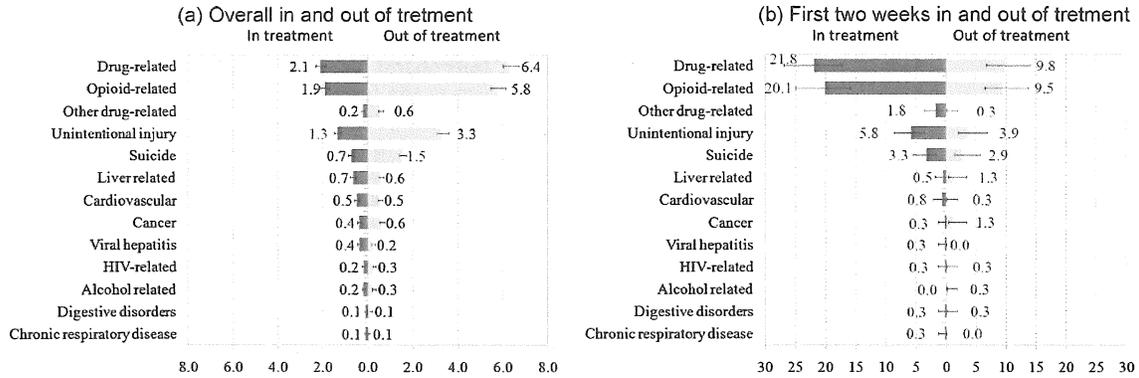


Fig. 4. Crude mortality rates (per 1000 PY) due to specific causes according to treatment period, 1985–2005. Overall in and out of treatment shown in the Left Panel; First two weeks in and out of treatment shown in the Right Panel.

the same as that during the remainder of treatment (5.6/1000 PYs). With no elevated risk during induction, then 121 deaths observed during induction might have been reduced to 24, 97 fewer deaths across the entire study period.

4. Discussion

This is one of the largest and longest follow up studies of persons receiving opioid pharmacotherapy for illicit opioid dependence. Data were examined on over 40,000 treatment entrants across a large State-based program for whom patterns of entry and departure from treatment were tracked. Time in treatment was associated with lower mortality than time out of treatment, with an overall in-treatment SMR of 4.5 (95% CI 4.3, 4.8), compared to an out-of-treatment SMR of 8.0 (95% CI 7.7, 8.3) (RR 1.9, 95% CI 1.8–2.0, $p < .001$).

The large sample size provided the necessary statistical power to confirm previous observations that induction onto methadone and the first fortnight following cessation of buprenorphine or methadone treatment are particularly risky periods. These elevations in risk varied over time and treatment exposures. Increased prior treatment episodes were associated with reduced risk during induction. The calendar period with the highest mortality risk during induction was 1990–1994 consistent with previous findings (Coplehorn, 1998), with later reductions reflecting changes in methadone dosing policies. Post-treatment mortality was highest between 1995 and 2000 when heroin availability and purity were at their historically highest levels in NSW (Degenhardt and Day, 2004; Day et al., 2006). The decline in SMRs during methadone induction with increasing treatment episodes may reflect selection effects, with those at highest risk dying earlier.

The continued elevated mortality risk during induction onto methadone to the end of the study period suggests that despite the adoption of dosing policies to reduce risk, more concerted efforts are needed to minimise these risks.

There are more complex issues for buprenorphine clients. Previous analyses finding they are less likely to be retained in treatment than methadone clients, and more likely to cycle in and out of treatment and switch between medications (Burns et al., 2009). This is of concern given that the period after cessation was equally risky for buprenorphine and methadone clients. The consequence is that any reduction in mortality risk during induction to buprenorphine may be offset by an increased mortality due to longer post-treatment periods. There is a clear need to investigate options to increase retention in buprenorphine treatment, which may include review of dosing levels since inadequate levels have been associated with poorer retention in treatment.

The causes of premature mortality were related to treatment stage. The reductions in risk during treatment were greatest for drug-induced deaths, suicide and traumatic deaths. These are the most common causes of mortality among opioid dependent persons (Darke et al., 2006); they are also fairly directly related to patterns of drug use, poor mental health, and high risk behaviors among those with illicit drug dependence. The fact that HIV mortality was low among this cohort reflects the sustained low prevalence of HIV among people who inject drugs in Australia (National Centre in HIV Epidemiology and Clinical Research, 2007). This, in turn, is linked to the early introduction of Needle and Syringe Programs (NSPs) and the expansion of the methadone program during the mid 1980s when HIV was first identified in Australia. The fluctuations in mortality rate in and out of treatment could also reflect changes in the heroin market in NSW during the period: mortality increased when heroin availability increased during the 1990s, and decreased when supply contracted after 2001 (Degenhardt and Day, 2004; Day et al., 2006).

4.1. Clinical implications

The observed reductions in mortality during treatment, if they can be entirely attributed to treatment, were clinically important and of population health significance. At the population level, the treatment program averted an additional 1111 deaths during the study period. This would have represented a 29% increase in the observed mortality rate.

Despite reductions in the mortality risk in the induction period for methadone from the peak in 1990–1994, the first two weeks of treatment still has an unacceptably elevated mortality risk. Preventive interventions are needed during induction onto methadone, particularly for first-time entrants to treatment. These need to address mental health problems, polydrug use, methadone dose, and lifestyle more generally.

Although buprenorphine did not have the elevated risk in the induction period, the overall treatment mortality levels were not significantly different for those in buprenorphine and methadone treatment. In addition, those who entered buprenorphine were retained for shorter periods, and more likely to cycle in and out of treatment (Burns et al., 2009), leading to more time spent in periods with a higher mortality risk. Overall, those who started in buprenorphine had exactly the same standardized mortality ratio as those who started in methadone, from 2001 onwards. Interventions to increase retention in buprenorphine are also important given the mortality risks faced by those who leave treatment prior to completion.

Interventions are needed to reduce the risks of relapse to drug use and suicide risk at treatment cessation. This is particularly

true among those who have cycled repeatedly in and out of treatment.

4.2. Limitations

In this study, we have compared mortality in- and out-of-treatment. It could be argued that mortality in treatment is lower because the people who stay in treatment are more stable than those who drop out. We doubt that this explains the difference, for three reasons. First, our findings are consistent with evidence from randomised controlled trials finding that opioid substitution treatment reduces mortality (Mattick et al., 2003). Second, in our study all comparisons involve people who chose to enter treatment at some point; we did not compare mortality with dependent users who choose not to seek treatment. We have made no assumptions about mortality reductions compared to opioid-dependent persons who never seek treatment. Third, the elevated causes of mortality during induction and following cessation, were those that opioid maintenance treatment is most likely to affect i.e. those reflecting the risks of a generally more chaotic and dependent illicit drug using lifestyle, such as drug overdose, accidents and suicides.

It is possible that the out of treatment mortality levels we documented are lower than the rates seen prior to treatment entry, or among those who never enter treatment. If this is true, this would reduce the observed difference between in- and out-of-treatment mortality, making our assessment of the mortality reduction in treatment conservative.

5. Conclusions

Mortality among opioid dependent people entering opioid pharmacotherapy is elevated compared to age and sex peers, with overdose, external causes and suicide the major contributors. This elevated mortality is higher when out of treatment (i.e. treatment reduces mortality), and it is particularly elevated during the first weeks out of treatment. The elevation in mortality varied in ways that probably reflect heroin availability and use. Mortality was highest during induction onto methadone. This varied over time, most likely reflecting changing policies on dosing during induction. Finally, this study found that mortality was equivalent whether patients were receiving methadone or buprenorphine. This finding suggests that the comparatively lower mortality during induction for buprenorphine may be offset by the increased risk of mortality during more frequent episodes of treatment entry and cessation that characterise buprenorphine clients.

Role of funding source

The National Drug and Alcohol Research Centre and the National Centre in HIV Epidemiology and Clinical Research are funded by the Australian Government Department of Health and Aging, and are both affiliated with the Faculty of Medicine at the University of New South Wales. This study is funded through the National Health and Medical Research Centre project grant 455451. Louisa Degenhardt is supported by a NHMRC Senior Research Fellowship (ID #510279). Tony Butler is supported by a NHMRC Career Award (ID #350992).

Contributors

L. Degenhardt conceived and supervised the study, and led the writing of the article. D.A. Randall undertook the statistical analysis. W.D. Hall contributed to the study design. M. Law provided advice on the statistical analysis of the study. All authors contributed to and have approved the final manuscript.

Conflict of interest

L. Degenhardt has been provided with funding by Reckitt Benckiser in the form of an untied educational grant to monitor the extent of injection of buprenorphine-naloxone injection after its introduction in Australia and to compare this with the injection of other OST forms. The design, conduct and interpretation of that study's findings were the work of the study investigators; Reckitt Benckiser had no role in these.

Acknowledgements

We would like to acknowledge the NSW Department of Health for providing the PHDAS data, and Ms Pia Salmelainen of the Pharmaceutical Services Branch, NSW Health, for her assistance with data extraction and interpretation.

Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at doi:10.1016/j.drugalcdep.2009.05.021.

References

- Australian Bureau of Statistics, 2007. 2005 Causes of Death, Australia. Canberra, Australian Bureau of Statistics.
- Brugal, M., Domingo-Salvany, A., Puig, R., Barrio, G., de Olalla, P., de la Fuente, L., 2005. Evaluating the impact of methadone maintenance programmes on mortality due to overdose and AIDS in a cohort of heroin users in Spain. *Addiction* 100, 981–989.
- Burns, L., Randall, D., Degenhardt, L., Hall, W., Law, M., Butler, T., Bell, J., 2009. Opioid agonist pharmacotherapy in New South Wales from 1985 to 2006: patient characteristics and patterns and predictors of treatment retention. *Addiction*, doi:10.1111/j.1360-0443.2009.02633.x.
- Buster, M.C., van Brussel, G.H., van den Brink, W., 2002. An increase in overdose mortality during the first 2 weeks after entering or re-entering methadone treatment in Amsterdam. *Addiction* 97, 993–1001.
- Caplehorn, J.R., 1998. Deaths in the first two weeks of maintenance treatment in NSW in 1994: identifying cases of iatrogenic methadone toxicity. *Drug and Alcohol Review* 17, 9–17.
- Caplehorn, J.R., Drummer, O.H., 1999. Mortality associated with New South Wales methadone programs in 1994: lives lost and saved. *Medical Journal of Australia* 170, 104–109.
- Darke, S., Degenhardt, L., Mattick, R.P. (Eds.), 2006. *Mortality Amongst Illicit Drug Users*. Cambridge University Press, Cambridge.
- Day, C., Degenhardt, L., Hall, W., 2006. Documenting the heroin shortage in New South Wales. *Drug and Alcohol Review* 25, 297–305.
- Degenhardt, L., Conroy, E., Day, C., Gilmour, S., Hall, W., 2005. The impact of the Australian heroin shortage on demand for and compliance with treatment for drug dependence. *Drug and Alcohol Dependence* 79, 129–135.
- Degenhardt, L., Day, C. (Eds.), 2004. *The Course and Consequences of the Heroin Shortage in New South Wales*. Australasian Centre for Policing Research, Adelaide.
- Degenhardt, L., Hall, W., Lynskey, M., Warner-Smith, M., 2004. Chapter 13 Illicit drug use. In: Ezzati, M., Lopez, A.D., Rodgers, A., Murray, R. (Eds.), *Comparative Quantification of Health Risks: Global and Regional Burden of Disease Attributable to Selected Major Risk Factors*, vol. 2. World Health Organization, Geneva, pp. 1109–1176.
- Degenhardt, L., Hall, W., Warner-Smith, M., 2006. Using cohort studies to estimate mortality among injecting drug users that is not attributable to AIDS. (review). *Sexually Transmitted Infections* 82 (Suppl. 3), 56–63.
- Mattick, R.P., Breen, C., Kimber, J., Davoli, M., 2003. Methadone maintenance therapy versus no opioid replacement therapy for opioid dependence. *Cochrane Database of Systematic Reviews* 2, CD002209.
- Mattick, R.P., Digusto, E., Doran, C., O'Brien, S., Shanahan, M., Kimber, J., Henderson, N., Breen, C., Shearer, J., Gates, J., Shakeshaft, A., NEPOD Trial Investigators, 2001. National evaluation of pharmacotherapies for opioid dependence (NEPOD). Canberra, Australian Government Department of Health and Ageing.
- National Centre in HIV Epidemiology and Clinical Research, 2007. *Australian NSP survey national data report 2001–2006*. Sydney, New South Wales, National Centre in HIV Epidemiology and Clinical Research, University of New South Wales.
- Randall, D., Roxburgh, A., Gibson, A., Degenhardt, L., 2009. *Mortality Among People Who Use Illicit Drugs: A Toolkit for Classifying Major Causes of Death*. NDARC Technical Report No. 301. National Drug and Alcohol Research Centre, University of NSW, Sydney. Downloadable from: [http://ndarc.med.unsw.edu.au/NDARCWeb.nsf/resources/TR+298-302/\\$file/TR301+Randall+et+al+Classifying+causes+of+death+2009.pdf](http://ndarc.med.unsw.edu.au/NDARCWeb.nsf/resources/TR+298-302/$file/TR301+Randall+et+al+Classifying+causes+of+death+2009.pdf).
- United Nations Office on Drugs and Crime, 2008. *World Drug Report 2008*. Vienna, United Nations.

Ward, J., Mattick, R.P., Hall, W., 1998. Methadone Maintenance Treatment and Other Opioid Replacement Pharmacotherapies. Harwood Academic Publishers, Amsterdam.

World Health Organization, 1977. Manual of the International Statistical Classification of Diseases, Injuries and Causes of Death (Ninth edition). Geneva, World Health Organization.

World Health Organization, 1993. Manual of the International Statistical Classification of Diseases, Injuries and Causes of Death (tenth edition). Geneva, World Health Organization.

World Health Organization, 2005. WHO Model List of Essential Medicines, 14th edition.

Medication-Assisted Treatment With Methadone: Assessing the Evidence

Catherine Anne Fullerton, M.D., M.P.H.
Meelee Kim, M.A.
Cindy Parks Thomas, Ph.D.
D. Russell Lyman, Ph.D.
Leslie B. Montejano, M.A., C.C.R.P.

Richard H. Dougherty, Ph.D.
Allen S. Daniels, Ed.D.
Sushmita Shoma Ghose, Ph.D.
Miriam E. Delphin-Rittmon, Ph.D.

Objective: Detoxification followed by abstinence has shown little success in reducing illicit opioid use. Methadone maintenance treatment (MMT) helps individuals with an opioid use disorder abstain from or decrease use of illegal or nonmedical opiates. This review examined evidence for MMT's effectiveness. **Methods:** Authors reviewed meta-analyses, systematic reviews, and individual studies of MMT from 1995 through 2012. Databases searched were PubMed, PsycINFO, Applied Social Sciences Index and Abstracts, Sociological Abstracts, Social Services Abstracts, and Published International Literature on Traumatic Stress. The authors rated the level of evidence (high, moderate, and low) based on benchmarks for the number of studies and quality of their methodology. They also described the evidence of service effectiveness and examined maternal and fetal results of MMT for pregnant women. **Results:** The review included seven randomized controlled trials and two quasi-experimental studies of MMT, indicating a high level of evidence for the positive impact of MMT on treatment retention and illicit opioid use, particularly at doses greater than 60 mg. Evidence suggests positive impacts on drug-related HIV risk behaviors, mortality, and criminality. Meta-analyses were difficult to perform or yielded nonsignificant results. Studies found little association between MMT and sex-related HIV risk behaviors. MMT in pregnancy was associated with improved maternal and fetal outcomes, and rates of neonatal abstinence syndrome were similar for mothers receiving different doses. Reports of adverse events were also found. **Conclusions:** MMT is associated with improved outcomes for individuals and pregnant women with opioid use disorders. MMT should be a covered service available to all individuals. (*Psychiatric Services* 65: 146–157, 2014; doi: 10.1176/appi.ps.201300235)

Dr. Fullerton and Ms. Montejano are with Truven Health Analytics, Cambridge, Massachusetts (e-mail: catherine.fullerton@truvenhealth.com). Ms. Kim and Dr. Thomas are with the Heller School for Social Policy and Management, Brandeis University, Waltham, Massachusetts. Dr. Lyman and Dr. Dougherty are with DMA Health Strategies, Lexington, Massachusetts. Dr. Daniels and Dr. Ghose are with Westat, Rockville, Maryland. Dr. Delphin-Rittmon is with the Office of Policy, Planning, and Innovation, Substance Abuse and Mental Health Services Administration (SAMHSA), Rockville. This article is part of a series of literature reviews that will be published in Psychiatric Services over the next several months. The reviews were commissioned by SAMHSA through a contract with Truven Health Analytics and were conducted by experts in each topic area, who wrote the reviews along with authors from Truven Health Analytics, Westat, DMA Health Strategies, and SAMHSA. Each article in the series was peer reviewed by a special panel of Psychiatric Services reviewers.

Opioid dependence is a serious public health concern. In the United States, approximately 800,000 individuals are heroin dependent (1), and 1.7 million report a substance use disorder involving prescription opioids (2). Opioid dependence is associated with premature mortality, criminality, violence, suicide, HIV and hepatitis C infection, and poor quality of life (3,4). Detoxification followed by abstinence-oriented treatments has shown little success in curtailing illicit opioid use over time (5,6). Methadone, an opioid agonist, and buprenorphine, a partial agonist, may be used in maintenance treatment to improve treatment outcomes. This review focused on methadone maintenance treatment (MMT); a companion review in this series examines buprenorphine (7).

The Substance Abuse and Mental Health Services Administration (SAMHSA) describes medication-assisted treatment as a direct service that provides a person who has a substance use disorder or a mental disorder with pharmacotherapy in conjunction with behavioral therapies as treatment for associated symptoms or disabilities. Treatment is individualized. Medication-assisted treatment with methadone refers to the use of methadone to treat individuals addicted to opioids. A definition of MMT and features of medication-assisted treatment are presented in Table 1.

This article reports the results of a literature review that was undertaken as part of the Assessing the

Evidence Base Series (see box on next page). The literature review was undertaken to describe MMT and its primary and secondary treatment goals, rate the levels of evidence (methodological quality) of existing studies for this treatment, and describe the effectiveness of this service. The results provide state mental health directors and their staff, purchasers of health services, state policy officials, community health care administrators, consumers, and family members with an accessible summary of the evidence for MMT and its implications for the treatment of opioid use disorders. To address the concerns of the target audiences, this review examined the evidence for MMT in various populations (including pregnant women), appropriate dosing guidelines, and serious adverse events related to methadone use.

Description of MMT

MMT has been available since 1964. In the United States, MMT is offered through specialized methadone treatment programs that provide psychosocial support as well as close patient monitoring. Typically, methadone doses are dispensed daily at the methadone treatment facility to minimize risks of diversion. However, individuals may become eligible for take-home doses on the basis of appropriate clinic attendance, absence of behavioral problems at the clinic or recent drug abuse, lack of known criminal activity, and evidence of a stable home with the ability to store methadone safely.

Because individuals remain dependent on methadone, MMT is not considered an abstinence treatment. The duration of methadone treatment is indefinite (8). The goals of methadone treatment are to reduce or eliminate illicit opioid use and, as a result, to decrease its associated negative outcomes (Table 1). For pregnant women, the goals of MMT include improved maternal and fetal outcomes.

MMT aims to allow individuals with opioid use disorders to minimize many of the negative health and societal outcomes associated with opioid use. Despite the long history of methadone use, studies have suggested that a majority of individuals

Table 1

Description of medication-assisted treatment with methadone

Feature	Description
Service definition	Medication-assisted treatment is a direct service that provides a person with a substance use or mental disorder with pharmacotherapy in conjunction with behavioral therapies as treatment for associated symptoms or disabilities. The nature of the services provided is determined by the person's current status or needs. Methadone maintenance treatment is a medication-assisted treatment that uses methadone to assist individuals with an opiate use disorder to abstain from or decrease the use of illegal opiates (for example, intravenous heroin) or the use of opiates in a nonprescribed manner (for example, abuse of prescription pain medications).
Service goals	Retention in treatment; decrease in illegal opioid use; decrease in mortality; decrease in nonopioid drug use; decrease in criminal activity; decrease in risk behaviors related to HIV and hepatitis C
Populations	Adults with opioid use disorders; pregnant women with opioid use disorders
Settings of service delivery	Methadone treatment centers

treated at methadone clinics receive inadequate doses and that many clinics place an arbitrary limit on the duration of treatment (9,10). This assessment of the available research will help inform behavioral health policy leaders about the effects of MMT on the lives of those with opioid use disorders and about its value as a treatment option and a covered health benefit.

Methods

Search strategy

We conducted a literature search of major databases: PubMed (U.S. National Library of Medicine and National Institutes of Health), PsycINFO (American Psychological Association), Applied Social Sciences Index and Abstracts, Sociological Abstracts, Social Services Abstracts, and Published International Literature on Traumatic Stress. We identified meta-analyses, research reviews, clinical guidelines, and individual studies about MMT that were published from 1995 through 2012. We used combinations of the following search terms: methadone, opioid maintenance treatment, opioid treatment, addiction pharmacotherapy, medication-assisted maintenance treatment, MMT, and pregnancy.

Additional literature was found by examining the bibliographies of major

reviews and meta-analyses, major clinical texts, and professional clinical society reviews. We relied on systematic reviews and meta-analyses to summarize relevant findings from earlier years. To provide additional information from recent years that may not have been included in review articles, we supplemented these review articles with articles presenting results from individual randomized controlled trials (RCTs) and quasi-experimental observational studies. We considered studies that were focused on MMT for adults with opioid use disorders, including pregnant women. Specific topics, such as adverse events and medication interactions, were also examined.

Inclusion and exclusion criteria

The abstracts of the identified articles were examined to determine compliance with inclusion and exclusion criteria. Articles on which opinions concurred were accepted. The following inclusion criteria were used: RCTs, quasi-experimental studies, systematic review articles, meta-analyses, and clinical guidelines; English-language studies conducted in the United States, including international studies that used U.S.-based sites and international reviews encompassing U.S.-based studies; and studies that

About the AEB Series

The Assessing the Evidence Base (AEB) Series presents literature reviews for 14 commonly used, recovery-focused mental health and substance use services. Authors evaluated research articles and reviews specific to each service that were published from 1995 through 2012 or 2013. Each AEB Series article presents ratings of the strength of the evidence for the service, descriptions of service effectiveness, and recommendations for future implementation and research. The target audience includes state mental health and substance use program directors and their senior staff, Medicaid staff, other purchasers of health care services (for example, managed care organizations and commercial insurance), leaders in community health organizations, providers, consumers and family members, and others interested in the empirical evidence base for these services. The research was sponsored by the Substance Abuse and Mental Health Services Administration to help inform decisions about which services should be covered in public and commercially funded plans. Details about the research methodology and bases for the conclusions are included in the introduction to the AEB Series (11).

focused on MMT for individuals with opioid use disorders or the use of MMT during pregnancy. Excluded were case studies, single-subject designs, and cross-sectional studies; studies that focused on methadone use for pain management or for detoxification from opioids; and reviews and meta-analyses that contained only articles that did not meet the inclusion criteria.

Strength of the evidence

The methodology used to rate the strength of the evidence is described in detail in the introduction to this series (11). The research designs of the studies identified during the literature search were examined. Three levels of evidence (high, moderate, and low) were used to indicate the overall research quality of the collection of studies. Ratings were based on predefined benchmarks that considered the number of studies and their methodological quality. If ratings were dissimilar, a consensus opinion was reached.

High ratings indicate confidence in the reported outcomes and are based on three or more RCTs with adequate designs or two RCTs plus two quasi-experimental studies with adequate designs. Moderate ratings indicate that there is some adequate research to judge the service, although it is possible that future research could influence reported results. Moderate

ratings are based on the following three options: two or more quasi-experimental studies with adequate design; one quasi-experimental study plus one RCT with adequate design; or at least two RCTs with some methodological weaknesses or at least three quasi-experimental studies with some methodological weaknesses. Low ratings indicate that research for this service is not adequate to draw evidence-based conclusions. Low ratings indicate that studies have nonexperimental designs, there are no RCTs, or there is no more than one adequately designed quasi-experimental study.

We accounted for other design factors that could increase or decrease the evidence rating, such as how the service, populations, and interventions were defined; use of statistical methods to account for baseline differences between experimental and comparison groups; identification of moderating or confounding variables with appropriate statistical controls; examination of attrition and follow-up; use of psychometrically sound measures; and indications of potential research bias.

Effectiveness of the service

We described the effectiveness of MMT—that is, how well the outcomes of the studies met the goals of MMT. We compiled the findings for separate outcome measures and study populations, summarized the results,

and noted differences across investigations. We considered the quality of the research design in our conclusions about the strength of the evidence and the effectiveness of MMT.

Results and discussion

Level of evidence

The literature search found seven RCTs (12–18) and two retrospective, quasi-experimental studies (19,20). Summaries of these individual studies are provided in Table 2. We also included 15 reviews or meta-analyses that examined multiple studies (21–35). Summaries of these reviews are included in Table 3.

Because of the large number of trials included as individual studies or as part of review articles, the overall evidence rating for MMT is high. Several meta-analyses, reviews, and RCTs representing more than three independent RCTs have reported on the primary outcomes of MMT, which are retention in treatment and reduction of illicit opioid use (12–16,21–24). In addition, meta-analyses, reviews, RCTs, and quasi-experimental studies representing more than three RCTs or two RCTs and two quasi-experimental studies have addressed secondary outcomes such as other illicit drug use, HIV risk behaviors, criminal behaviors, heroin craving, and mortality (15–17,21,23–27).

Effectiveness of MMT

Research supports MMT's positive impact on treatment retention and suppression of heroin use, particularly at higher methadone doses. Findings regarding secondary outcomes are mixed, although there is general support that MMT has a positive impact on criminal activity associated with heroin use, as well as on mortality and risk behaviors for HIV and hepatitis C infection.

MMT versus placebo or no pharmaceutical maintenance treatment. Most of the literature on the effectiveness of MMT versus placebo or no medication-assisted treatment was published between the 1960s and 1990s. In general, these and later studies found that when MMT is provided at adequate dose levels, it is more effective than no medication treatment

Table 2

Individual studies of methadone maintenance treatment (MMT) included in the review^a

Study	Design and objectives	Population and conditions	Outcomes measured	Summary of findings
Strain et al., 1999 (13)	Double-blind, 40-week RCT to compare moderate versus high doses of methadone in treatment of adults with opioid dependence	Patients randomly assigned to daily oral methadone hydrochloride; patients receiving a dose ranging from 40–50 mg (N=97) compared with those receiving a dose ranging from 80–100 mg (N=95); all received substance abuse counseling	Primary: opioid-positive urinalysis and treatment retention	No differences in treatment retention through week 40 (mean retention in high-dose group, 159 days; in moderate-dose group, 157 days). The high-dose group had significantly greater reduction in opioid-positive urinalysis compared with the medium-dose group: 53.0% (CI=46.9%–59.2%) versus 61.9% (CI=55.9%–68.0%) (p=.047).
Sees et al., 2000 (12)	RCT to compare outcomes of patients with opioid dependence treated with MMT or with psychosocially enriched, 180-day methadone-assisted detoxification	Patients randomly assigned to MMT (N=91), including 2 hours of psychosocial therapy per week during first 6 months; patients randomly assigned to detoxification (N=88), including 3 hours of psychosocial therapy per week, 14 educational sessions, and 1 hour of cocaine group therapy (if needed) for 6 months	Primary: treatment retention, heroin and cocaine abstinence (by self-report and monthly urinalysis), HIV risk behaviors, and functioning in 5 problem areas (employment, family, psychiatric, legal, and alcohol use)	MMT resulted in greater treatment retention (median retention, 438.5 days versus 174.0 days for comparison group) and lower heroin use. MMT group had a lower rate of drug-related HIV risk behaviors at 12 months (mean±SD=.05±.13 versus .13±.19).
McCarthy et al., 2005 (19)	Retrospective cohort study to compare the effects of high-dose versus low-dose methadone during pregnancy on maternal and fetal outcomes	Mothers who received methadone (N=81) and their offspring; half of mothers assigned to a high-dose group (≥100 mg) and half to a low-dose group (<100 mg)	Primary: rate of medication treatment for neonatal abstinence symptoms, days of infant hospitalization	High doses of methadone were not associated with increased risks of NAS symptoms. High doses had a positive effect on maternal drug abuse: in high-dose group, 11% of infant toxicology screens were positive for illicit drugs, compared with 27% in low-dose group (p=.05).
Schwartz et al., 2006 (14)	RCT to compare outcomes of adults assigned to interim methadone treatment or to a wait-list control group	Participants (N=319) meeting criteria for heroin dependence and for receipt of MMT assigned to interim methadone treatment (N=199) or wait-list control group (N=120)	Primary: rate of standard MMT enrollment, self-reported heroin use, opioid-positive urinalysis, illegal income received, and money spent on drugs	Participants who received interim methadone treatment entered standard MMT at a significantly higher rate than those on the wait list (75.9% versus 20.8%, p<.001). At 4 months, the interim methadone treatment group reported significantly fewer days of heroin use (p<.001), had reduced heroin-positive urine screens (p<.001), reported spending less on drugs (p<.001), and received less illegal income (p<.02).
Jones et al., 2010 (44)	Double-blind RCT to compare neonatal and maternal outcomes of opioid-dependent women treated with methadone or with buprenorphine during pregnancy	Pregnant women (N=175) with opioid dependence; methadone group (N=89; 16 dropped out) and buprenorphine group (N=86; 28 dropped out); 131 neonates of mothers who were followed to the end of pregnancy (58 exposed to buprenorphine, 73 exposed to methadone)	Primary: percentage of neonates treated for NAS, NAS peak score, duration of hospital stay, morphine required to treat NAS, and neonatal head circumference; secondary: treatment retention and reduction in opiate use	Buprenorphine group required less morphine for NAS than methadone group (mean dose=1.1 mg versus 10.4 mg, p<.009), had a shorter hospital stay (10.0 days versus 17.5 days, p<.009), and had a shorter duration of treatment for NAS (4.1 days versus 9.9 days, p<.003); 33% of buprenorphine group discontinued treatment before delivery, compared with 16% of methadone group.
Wilson et al., 2010 (17)	RCT to examine use of interim methadone treatment on HIV risk behavior among adults with heroin dependence	Heroin-dependent adults (N=319) randomly assigned to interim methadone treatment without counseling (N=199) or to wait-list control group (N=120) without automatic admission after 120 days	Primary: AIDS Risk Assessment questionnaire (assesses HIV infection and HIV sex risk behaviors) at baseline and follow-up	For injection risk scale score, injected drugs, and sex risk score, treatment condition (p<.008, p<.03, and p<.04, respectively) and time effects (p<.001, p<.001, p<.02) were significant for injection risk, with interim methadone group performing better than wait-list control group.

Continues on next page

Table 2

Continued from previous page

Study	Design and objectives	Population and conditions	Outcomes measured	Summary of findings
Pizarro et al., 2011 (20)	Retrospective cohort study to assess the incidence of clinically significant NAS	Pregnant methadone users (N=174) stratified into three dose groups: low (0–50 mg per day, N=59), medium (51–100 mg per day, N=63), and high (>100 mg per day, N=52)	Primary: rate and severity of NAS, birth weight, preterm birth rate, and neonatal morbidities and mortality	Regardless of methadone dose, rates of NAS were similar among low-dose, medium-dose, and high-dose groups (40.7%, 52.4%, and 40.8%, respectively; $p>.05$). No significant outcomes were found.
Schwartz et al., 2011 (15)	RCT to evaluate the impact of counseling on the first 4 months of MMT among 3 comparison groups	Participants (N=244) newly admitted to methadone treatment programs from wait lists and randomly assigned to emergency counseling only for 120 days followed by standard treatment (N=108), standard psychosocial services (N=107), or counseling by case managers with small caseloads (N=29)	Primary: treatment retention and Addiction Severity Index, which includes alcohol and drug use; medical, psychological, and legal issues; family and social relationships; and employment status	Counseling had no significant impact on treatment retention or rate of positive urine tests for methadone group. All groups showed reduction in self-reported days of criminal activity, money spent on drugs, and illegal income compared with baseline (all $p<.001$).
Schwartz et al., 2012 (16)	RCT to evaluate the impact of counseling on MMT among 3 comparison groups at 12 months (follow-up of the Schwartz et al. [15] sample)	Participants (N=230) from previous RCT; 3 conditions: emergency counseling (N=99), standard counseling (N=104), or counseling by case managers with small caseloads (N=27)	Primary: treatment retention and Addiction Severity Index, which includes alcohol and drug use; medical, psychological, and legal issues; family and social relationships; and employment status	No significant differences were found in treatment retention between the supervised methadone (60.6%), standard methadone (54.8), and restored methadone (37.0%) treatment groups. Positive urine screens declined significantly from baseline for all groups ($p<.001$ for heroin and $p<.003$ for cocaine metabolites). No significant group \times time interactions were found for these measures.

^a Studies are listed in chronological order. Abbreviations: CI, 95% confidence interval; NAS, neonatal abstinence syndrome; RCT, randomized controlled trial

in retaining patients in treatment and reducing illicit opioid use (21,22,28,29).

Recently, Mattick and colleagues (21) conducted a review for the Cochrane Collaboration of 11 RCTs (two of which were double-blinded) that assessed the effectiveness of MMT compared with treatments with no opioid replacement therapy (that is, detoxification protocols, drug-free rehabilitation protocols, placebo medications, or wait-list control groups). The combined total of participants across 11 studies was 1,969. On the basis of meta-analyses, the authors concluded that methadone was significantly more effective than non-pharmacological treatment in retaining patients in treatment and in suppressing heroin use as measured by urine drug testing. No significant difference was found between the two treatment conditions (MMT and no opioid replacement therapy) in their impact on criminal activity or mortality, although

individual studies showed a greater reduction in both outcomes among patients receiving MMT. Three of the 11 studies reviewed by Mattick and colleagues measured criminal activity, and four measured mortality.

Sees and colleagues (12) compared outcomes of individuals with opioid dependence who were receiving MMT (N=91) or who were in a 180-day psychosocially enriched detoxification program (N=88). One goal of this study was to examine alternatives to indefinite MMT use by looking at a six-month detoxification rather than the faster detoxification programs (usually one month) studied in the past. For six months the detoxification group received psychosocial services that included three hours of psychosocial therapy per week, 14 educational sessions, and one hour of group therapy focused on cocaine use; the group also received six months of aftercare. The group receiving MMT

had longer retention in treatment compared with the detoxification group (median of 438.5 versus 174 days). The MMT group also showed lower rates of heroin use and lower rates of drug-related HIV risk behaviors compared with the detoxification group. There were no differences between the two groups in sex-related HIV risk behaviors or in employment, family functioning, or alcohol use outcomes.

Two systematic reviews and meta-analyses have examined the impact of MMT on HIV high-risk behaviors. Both reviews noted the limited number of RCTs that contributed to their results. One review (N=12 studies) found that MMT was associated with a 54% reduction in the risk of HIV infection (25). The second review (N=36 studies) was unable to combine results from the studies; the authors concluded that across studies MMT reduced drug-related risk factors such as sharing of injection

Table 3Review articles about methadone maintenance treatment (MMT) included in the review^a

Study	Focus of review	Studies included	Outcomes measured	Summary of findings
Hall et al., 1998 (22)	Effectiveness of MMT on heroin use and crime	6 RCTs assessing MMT, and 8 additional generalized observational studies	Primary: reduction in heroin use and illicit opioid use, criminal activity	Although variation in outcomes between different programs was noted, the effectiveness of MMT in controlling heroin and illicit opioid use and crime was generally supported through the RCTs and observational studies.
Fletcher and Battjes, 1999 (29)	Epidemiological Drug Abuse Treatment Outcome Studies (DATOS) conducted at multiple U.S. sites	12-month follow-up sample based on 2,966 interviews from 76 U.S. programs	Primary: treatment retention and various other treatment outcomes	DATOS study results for drug treatment outcomes were consistent with prior evaluation findings, indicating that the major treatment modalities (including outpatient methadone treatment) are effective in reducing illicit drug use, reducing the incidence of drug-related criminal behavior, and supporting improvement of health, mental health, and social functioning.
Faggiano et al., 2003 (23)	Efficacy and safety of various dose ranges of MMT for opioid dependence	21 studies, including 11 RCTs (2,279 total participants) and 10 controlled prospective studies (3,715 total participants)	Primary: retention rate, opioid use (self-reported), opioid abstinence (urine screen), cocaine abstinence (urine screen), and overdose mortality	RCTs showed that high doses of MMT were associated with better treatment retention (high versus low doses at longer follow-ups, RR=1.62, CI=.95–2.77), opioid abstinence (high versus low, RR=1.59, CI=1.16–2.18; high versus middle, RR=1.51, CI=.63–3.61), and cocaine abstinence (high versus low, RR=1.81, CI=1.15–2.85). At 6-year follow-up, controlled prospective studies showed lower overdose mortality at higher doses (high versus low doses, RR=.29, CI=.02–5.34; high versus middle, RR=.38, CI=.02–9.34; and middle versus low, RR=.57, CI=.06–5.06).
Center for Substance Abuse Treatment, 2004 (32)	National assessment of deaths associated with methadone use; recommendations for reducing mortality from methadone	National assessment of methadone-associated mortality in May 2003	Primary: methadone-associated mortality	Evidence suggests that an increase in methadone-attributable deaths in 1999–2004 was largely related to increased use for pain analgesia. SAMHSA highlights the importance of public understanding that related mortality is essentially eliminated when methadone is prescribed, dispensed, and used appropriately.
Connock et al., 2007 (28)	Clinical and cost effectiveness of BMT and MMT for the management of opioid-dependent individuals	31 systematic reviews and 27 RCTs	Primary: retention in treatment and illicit use of opioids	At all doses used in the studies (MMT, 20–97 mg per day; BMT ≤5–18 mg per day), treatment retention was better than in the placebo or no therapy groups (MMT, RR=3.91, CI=1.17–13.2; BMT, RR=1.74, CI=1.06–2.87). Higher doses of MMT and BMT were almost always more effective than lower doses for treatment retention and illicit use reduction. Across comparable doses, MMT was more effective than BMT for treatment retention, except at low doses. At low doses, the two medications appeared comparable (≤35 mg of MMT versus 6–16 mg of BMT, RR=1.01, CI=.66–1.54). No significant difference across studies was found in illicit opiate use between flexible-dose MMT and BMT.

Continues on next page

Table 3*Continued from previous page*

Study	Focus of review	Studies included	Outcomes measured	Summary of findings
Mattick et al., 2009 (21)	Effectiveness of MMT compared with treatments not involving opioid replacement therapy	11 RCTs (1,969 total participants)	Primary: patient retention in treatment and heroin use suppression as measured by urine drug testing; secondary: criminal activity and mortality	MMT was significantly more effective than nonreplacement approaches in treatment retention and suppression of heroin use (measured by self-report and lab analysis) (6 RCTs, RR=.66, CI=.56-.78). No significant differences were found for criminal activity (3 RCTs, RR=.39, CI=.12-1.25) or mortality (4 RCTs, RR=.48, CI=.10-2.39).
Cleary et al., 2010 (31)	Relationship between maternal methadone dose in pregnancy and diagnosis or medical treatment of NAS	67 studies in the systematic review; 29 studies in the meta-analysis	Primary: key conclusions, including incidence, severity, and duration of NAS outcomes in relation to maternal methadone dose	Meta-analysis did not demonstrate a consistent, significant difference in NAS incidence among neonates of women on low versus high methadone doses at delivery. Nineteen studies found a relationship between methadone dose and incidence, severity, or duration of NAS; 18 did not find a relationship; 30 did not report on the relationship.
Fareed et al., 2010 (24)	Update for clinicians about methadone dosing, with dose recommendations	24 studies, including 12 RCTs, 10 observational studies, and 2 meta-analyses	Primary: effect of methadone dose on retention in treatment, illicit opioid use, and mortality	Treatment retention: 9 studies reported that the daily dose range of 60-100 mg showed significant improvement for treatment retention compared with lower doses. Six studies did not find a significant difference in retention for this dose range. Illicit opioid use: 10 studies recommended a daily dose range of 60-100 mg; 2 studies suggested that doses over 100 mg are more effective for decreasing heroin use. Mortality rate: 2 long-term observational studies reported doses greater than 100 mg daily to be safe and effective in long-term MMT (the authors stated that more research is needed).
Modesto-Lowe et al., 2010 (35)	Risk factors for methadone mortality in opioid-dependent and pain populations; guidelines for initiating methadone treatment in these populations to minimize risk of death	Literature review (N of studies not reported) of pharmacological properties and relationship to risk factors for adverse events	Primary: pharmacological profile of methadone and relationship to risk factors for methadone mortality	Risk factors of respiratory depression include advanced age, medically compromised status, liver or pulmonary pathology, sleep apnea, polysubstance abuse, opioid-naïve or low opioid tolerance, high doses of methadone, and rapid titration of methadone. Risk factors for Torsades de Pointe include female sex, electrolyte imbalance, liver or cardiac pathology, unexplained syncope or seizures, other drug and medication use that prolongs QT interval or inhibits CYP 3A4, prolonged QT interval, and high doses of methadone.
Amato et al., 2011 (30)	Effectiveness of any psychosocial and any agonist maintenance treatment compared with standard agonist treatment for opiate dependence	35 RCTs considering 13 different psychosocial interventions (4,319 total participants)	Primary: treatment retention, opiate use during treatment, compliance with sessions during treatment, and other psychological health measures	Compared with standard maintenance treatment, psychosocial and any maintenance treatment showed no benefit for treatment retention (27 studies, 3,124 participants, RR=1.03, CI=.98-1.07), opiate abstinence during treatment (8 studies, 1,002 participants, RR=1.12, CI=.92-1.37), or compliance (3 studies, mean difference=.43, CI=-.05 to .92), among other findings. Comparisons of the various

Continues on next page

Table 3

Continued from previous page

Study	Focus of review	Studies included	Outcomes measured	Summary of findings
				psychosocial approaches showed no significant differences in any outcomes.
Fareed et al., 2011 (27)	Effect of MMT on opiate craving	Total of 16 studies: RCTs, observational studies, meta-analyses, and reviews	Primary: effect of MMT on subjective opiate craving and on objective measures of opiate craving	Seven studies reported that methadone could reduce heroin craving, 4 reported that MMT patients are still at risk for craving, 1 study reported that methadone could increase heroin craving, and 4 studies reported that methadone had a neutral effect on heroin craving.
Gowing et al., 2011 (26)	Effect of oral substitution treatment for opioid-dependent drug injectors on behaviors associated with high risk of HIV transmission; incidence of HIV infections	38 studies (nearly 12,400 total participants). Two studies were RCTs; 11 were controlled trials, but the intervention was not relevant to the review, and therefore, these trials were used as a baseline versus postintervention comparison; 21 were observational prospective studies; 4 were cross-sectional.	Primary: HIV transmission risk behaviors, including drug use; secondary: rates of HIV infection	Substitution treatment for opioid-dependent, injecting drug users with methadone or buprenorphine was consistently associated with significant reductions in illicit opioid use, injecting drug use, and sharing of needles. It was associated with a reduction in the use of multiple sex partners or the exchange of sex for money or drugs, but it was not associated with increased condom use. The risk behavior reduction appeared to relate to reductions in cases of HIV infection, although data were not pooled because of variability and bias among studies.
Martin et al., 2011 (34)	Adverse cardiac events associated with methadone	Expert panel examined the peer-reviewed literature, regulatory actions, professional guidance, and opioid treatment program outcomes	Primary: cardiac events associated with methadone, cardiac QT interval impact	Results established the connection between methadone and prolongation of QT interval and suggested a dose-dependent effect for methadone. Authors recommended that every opioid treatment program should have a universal cardiac risk management plan (to the extent possible) for patients with identified risk factors for adverse cardiac events.
Webster et al., 2011 (33)	Causes and risk factors for opioid-related poisoning deaths and recommendations to reduce death rates	91 documents were assessed by a panel of experts	Primary: frequency, demographic characteristics, and risk factors for opioid-related deaths attributable to overdose in the past decade	Risk factors for methadone-related deaths were unanticipated medical or mental health comorbidities, payer policies that encourage or mandate methadone as first-line therapy, the presence of additional central nervous system-depressant drugs, and sleep-disordered breathing. Cardiac irregularities in the presence of methadone remain an uncommon cause of death.
MacArthur et al., 2012 (25)	HIV risk: quantify the effect of opiate substitution treatment in relation to HIV transmission among individuals who inject drugs	Pooled data from 9 observational studies, including 819 incident HIV infections over 23,608 person-years of follow-up	Primary: impact of opiate substitution treatment as related to HIV incidence; secondary: effect of variables such as mode and duration of treatment, geographical region, study setting, and participant characteristics	Substitution treatment was associated with an average 54% reduction in the risk of HIV infection among individuals who inject drugs (rate ratio=.46, CI=.32-.67; p<.001). Heterogeneity was found between studies that could not be explained by region, site of recruitment, or incentives.

^a Studies are listed in chronological order. Abbreviations: BMT, buprenorphine maintenance treatment; CI, 95% confidence interval; NAS, neonatal abstinence syndrome; RCT, randomized controlled trial; RR, relative risk or risk ratio

equipment (26). The second review reported that there were too few studies to be conclusive but stated that MMT was associated with lower rates of multiple sex partners and the exchange of sex for drugs or money and had no effect on the use of condoms.

Interim methadone treatment is a program that allows provision of methadone under daily supervision for up to 120 days while the individual is awaiting placement in a standard methadone program. It does not include counseling other than emergency counseling. One RCT examined HIV risk behaviors for 319 opioid-addicted adults who were randomly assigned to interim methadone treatment or a wait list (17). Rates of drug injection and sex while high on drugs were significantly lower for individuals randomly assigned to the interim methadone program.

Another review examined the effect of MMT on heroin craving and included 16 studies (27). It found mixed results; seven studies showed that MMT reduced heroin craving, four studies showed that patients were still at risk of heroin craving, one study showed that methadone could increase heroin craving, and four studies showed a neutral effect. In general, the studies that showed positive results used higher methadone doses, and those with negative or neutral results used lower doses or were in the setting of methadone detoxification.

Levels of methadone doses. The literature has consistently shown that the effectiveness of MMT increases when methadone is used at doses above 60 mg. Two systematic reviews suggested that higher doses of methadone were associated with improved outcomes. First, Faggiano and colleagues (23) performed a systematic review for the Cochrane Collaboration that evaluated the efficacy and safety of different doses of methadone for opioid dependence. This review included 21 studies (11 RCTs and ten controlled, prospective, quasi-experimental studies). The authors examined outcomes for four different dose ranges: low (1–39 mg), medium (40–59 mg), high (60–109 mg), and very high (≥ 110 mg). Results showed that high doses were associated with

better treatment retention and cocaine abstinence, less heroin use during treatment, and fewer withdrawal symptoms. Few studies included doses above 110 mg; therefore, the data were less reliable for these doses. Only one underpowered study examined mortality and criminal activity, but a trend that did not reach statistical significance suggested that individuals receiving higher doses had lower mortality rates. A second review showed similar results; doses above 60 mg were associated with better treatment retention and fewer urine drug tests that were positive for opioids (24).

Strain and colleagues (13) conducted a 40-week, double-blinded RCT comparing moderate (40–50 mg, N=97) and high (80–100 mg, N=95) doses of methadone in the treatment of adults with opioid dependence. There were two main outcome measures: opioid-positive urinalysis and treatment retention. The study found no difference in treatment retention through week 40. The high-dose group had significantly greater reduction in opioid-positive urinalysis (53%) compared with the medium-dose group (62%).

Service delivery and psychosocial treatments. Many methadone treatment centers have wait lists, which indicate a lack of access to desired treatment. Given the high social cost of opioid addiction, a research group investigated the use of interim methadone treatment as a way to improve access and decrease waiting lists. Schwartz and colleagues (14) conducted an RCT to compare outcomes for adults assigned to interim methadone treatment (N=199) or a wait-list control group (N=120). The study found that participants in the interim methadone treatment cohort entered standard MMT at a significantly higher rate (75%) than those assigned to the wait list (20.8%). In addition, at four months, interim methadone treatment participants reported significantly lower rates of heroin use than wait listed participants, had fewer positive drug tests for heroin, reported spending significantly less money on drugs, and received less illegal income.

Schwartz and colleagues (15,16) compared individuals who were admitted to interim methadone (N=99),

standard methadone (N=104), and restored methadone (N=27) treatment. Restored methadone treatment refers to treatment by counselors with reduced caseloads, which allows them to provide more intensive treatment. The studies found no difference between groups in treatment retention at four months and better treatment retention for the interim and standard methadone treatment groups at 12 months. No between-group differences in opiate use or other drug use were found at the four- and 12-month follow-up assessments. At 12 months, no difference was noted between groups in arrests, criminal activity, or money spent on drugs. Self-reported illegal income was significantly higher in the standard methadone treatment group.

A Cochrane Collaboration systematic review by Amato and associates in 2011 (30) examined 35 studies that evaluated whether outcomes improved after the addition of a specific, structured psychosocial intervention to standard agonist maintenance treatment (either methadone or buprenorphine) that already included psychosocial treatment. The studies included 13 different psychosocial interventions that were added to standard treatment. Taken as a whole, additional psychosocial treatment did not statistically improve retention in treatment, use of opiates during treatment, session attendance during treatment, or other measures of psychological health. When the review was limited to studies with contingency management approaches, there still was no statistically significant effect of additional psychosocial services on treatment retention or decreased opioid use. Contingency management describes behavioral modification programs that provide rewards, such as retail gift cards, for desired behaviors, such as negative urinalyses. Because standard treatment included psychosocial treatment, Amato and colleagues could draw conclusions only regarding the addition of a structured psychotherapy and not regarding the efficacy of psychosocial treatment.

Pregnant women subgroup. Early studies established the efficacy of using MMT to reduce pregnancy-related maternal and fetal morbidity among

opioid-addicted pregnant women (36,37). MMT during pregnancy was associated with decreased illicit opioid use, increased rates of prenatal retention in treatment, decreased pregnancy complications, and generally improved fetal outcomes (18,38). However, MMT has been found to put newborn infants at risk for neonatal abstinence syndrome (NAS)—a condition characterized by dysfunction of the autonomic nervous system, gastrointestinal tract, and respiratory system and by irritability of the central nervous system. NAS often requires detoxification treatment in the hospital with a morphine taper (19,37,39–41). Reported rates of withdrawal symptoms among neonates born to opioid-addicted mothers who continued to use opiates within a week of giving birth range from 55% to 94% (42), and rates of NAS that develop among neonates as a result of treating the mother with MMT during pregnancy fall into this range (31). Recent studies on the long-term impact of NAS on development are scant. Older studies indicated no differences in cognitive performance among four-year-old children of mothers receiving MMT and children of mothers with similar demographic characteristics in a control group. However, scores of children in both groups were lower than population norms (43).

To guide clinicians regarding the necessity of tapering MMT before delivery, researchers have examined the relationship between methadone dose during pregnancy and the incidence and severity of NAS among newborn infants. Because of increased methadone metabolism during pregnancy, pregnant women often require higher doses. Cleary and colleagues (31) performed a systematic review and meta-analysis and found that methadone dose had no consistent effect on rates of NAS and other neonatal outcomes. Two of the 67 studies included in that review were RCTs, and the remaining studies had quasi-experimental observational designs. Additional retrospective cohort studies showed similar results; no difference in NAS rate or severity was found on the basis of methadone dose during pregnancy (19,20).

The Maternal Opioid Treatment: Human Experimental Research

Evidence for the effectiveness of methadone maintenance treatment: high

Evidence clearly shows that MMT has a positive impact on:

- Retention in treatment
- Illicit opioid use

Evidence is less clear but suggestive that MMT has a positive impact on:

- Mortality
- Illicit drug use (nonopioid)
- Drug-related HIV risk behaviors
- Criminal activity

Evidence suggests that MMT has little impact on:

- Sex-related HIV risk behaviors

(MOTHER) study was a large, multi-center, double-blind RCT published in 2010 (44). The authors compared neonatal and maternal outcomes between pregnant women treated during their pregnancies with methadone (dose range 20–140 mg) or buprenorphine (dose range 2–32 mg). Eighty-nine women were randomly assigned to receive methadone, and 86 were randomly assigned to receive buprenorphine. Thirty-three percent of women in the buprenorphine group discontinued treatment before delivery, compared with 16% in the methadone group. No significant differences were found in the percentage of newborns treated for NAS. However, infants born to women treated with methadone required higher doses of morphine to treat NAS, required more days of treatment for NAS, and had longer hospital stays. There were no differences in maternal use of illicit drugs at delivery or other fetal or maternal outcomes. These results suggest that less severe NAS among infants born to mothers treated with buprenorphine may be confounded by poorer treatment retention rates for these mothers, especially for mothers with a longer history of heroin use.

Adverse events. Between 1999 and 2004, deaths attributed to methadone increased by 390%. Evidence suggests that this change was largely related to the increased use of methadone for pain analgesia rather than MMT (32,33). Nonetheless, the sharp rise of methadone-related deaths highlights safety issues—in particular, the risks of respiratory depression and cardiac QT interval

prolongation. The QT interval is a measure of time between the start of the Q wave and the end of the T wave in the heart's electrical cycle that is measured by an electrocardiogram. Prolongation of the QT interval can lead to serious heart arrhythmias such as Torsades de Pointes (TdP) and sudden death. As a result of this rise in mortality, the U.S. Food and Drug Administration issued a physician safety alert in 2006 highlighting fatalities and cardiac arrhythmias associated with methadone (34).

Respiratory depression is most often a consequence of methadone accumulation and use of concurrent illicit drugs or medications that also suppress the central nervous system. Reviews suggest that initiation into methadone treatment is a particularly vulnerable time in both methadone maintenance and pain therapy populations, particularly if the dose is increased rapidly (33,35). The most common drugs associated with respiratory suppression are benzodiazepines and alcohol. Deaths from respiratory depression may also be caused by inappropriate dosing by methadone recipients and by diversion of methadone, which occurs when individuals who have a prescription for methadone sell or give their methadone to others rather than using it themselves.

In 2007–2009, a panel established by SAMHSA summarized evidence of methadone's impact on the cardiac QT interval and derived guidelines for methadone treatment programs (34). The review established a connection between methadone and prolongation of the QT interval and suggested

a dose-dependent effect for methadone. Prolongation of the QT interval greater than 500 ms confers significant risk with respect to arrhythmias such as TdP (34). Use of additional medications that might increase the QT interval increases an individual's risk of cardiac arrhythmias. Despite these findings, cardiac irregularities in the presence of methadone remain an uncommon cause of death (33).

Conclusions

Overall, there is a high level of evidence for the effectiveness of MMT in improving treatment retention and decreasing illicit opioid use (see box on previous page). Research findings regarding the impact of MMT on many secondary outcomes, such as mortality, drug-related HIV risk behaviors, and criminal activity, are less conclusive but suggest positive trends. Finally, research has not conclusively shown positive impacts on sex-related HIV risk behaviors, non-opioid illicit drug or alcohol use, or other social consequences. Methadone maintenance doses above 60 mg confer greater efficacy in retention and suppression of illicit opioid use; however, there is limited evidence that doses above 100 mg provide additional benefits. No evidence has emerged to delineate the duration of MMT beyond an indefinite period. Although MMT generally is believed to reduce mortality risk among individuals with opioid dependence, methadone is also associated with significant adverse events, such as respiratory depression and cardiac arrhythmias, in the presence of rapid titrations or other risk factors. There is no clear evidence that structured psychotherapy provided in addition to the psychosocial support normally offered at methadone treatment centers conveys additional benefit.

MMT improves pregnancy-related outcomes by reducing illicit drug use and increasing treatment retention. However, newborn infants of mothers treated with methadone during pregnancy may be born with NAS irrespective of the methadone dose used by the mothers.

Potential areas for future research include increased focus on the impact

of MMT on secondary outcomes, development of a better understanding of the efficacy and safety tradeoffs of very high methadone doses (>100 mg), confirmation of the results of interim methadone treatment as a potential avenue to improve outcomes of MMT, and use of MMT in specific subpopulations, such as racial and ethnic minority groups and individuals who use prescription drugs compared with those who use intravenous heroin.

Given the poor success rates of abstinence-based treatments for opioid use disorders, MMT is an important treatment option for opioid dependence. Providers, consumers, and family members should be educated about the benefits of MMT in helping individuals manage opioid use disorders and about appropriate ways to avoid the significant adverse events that can occur with methadone. Providers and consumers need to be educated regarding appropriate doses to improve efficacy and appropriate initiation to minimize adverse events.

Because of MMT's relative efficacy, efforts should be made to increase access to MMT for all individuals who struggle with opioid use disorders. Directors of state mental health and substance abuse agencies and community health organizations should look for methods to increase access to MMT, and purchasers of health care services should cover appropriately monitored MMT.

Acknowledgments and disclosures

Development of the Assessing the Evidence Base Series was supported by contracts IIISS283200700029I/IIISS28342002T, IIISS283200700006I/IIISS28342003T, and IIISS283200700017I/IIISS28300001T from 2010 through 2013 from the Substance Abuse and Mental Health Services Administration (SAMHSA). The authors acknowledge the contributions of Robert Lubran, M.S., M.P.A., Kevin Malone, B.A., and Suzanne Fields, M.S.W., from SAMHSA; John O'Brien, M.A., from the Centers for Medicare & Medicaid Services; John Easterday, Ph.D., Linda Lee, Ph.D., Rosanna Coffey, Ph.D., and Tami Mark, Ph.D., from Truven Health Analytics; and Sandrine Pirard, M.D., Ph.D., from National Institute on Drug Abuse. The views expressed in this article are those of the authors and do not necessarily represent the views of SAMHSA.

The authors report no competing interests.

References

- Lloyd J: Drug Policy Information Clearinghouse Fact Sheet: Heroin. Washington, DC, Office of National Drug Control Policy, 2003
- Results From the 2007 National Survey on Drug Use and Health: National Findings. NSDUH Series H-34, pub no SMA 08-4343. Rockville, Md, Substance Abuse and Mental Health Services Administration, Office of Applied Studies, 2008
- Goldstein A, Herrera J: Heroin addicts and methadone treatment in Albuquerque: a 22-year follow-up. *Drug and Alcohol Dependence* 40:139-150, 1995
- Hulse GK, English DR, Milne E, et al: The quantification of mortality resulting from the regular use of illicit opiates. *Addiction* 94:221-229, 1999
- Hser YI, Hoffman V, Grella CE, et al: A 33-year follow-up of narcotics addicts. *Archives of General Psychiatry* 58:503-508, 2001
- Termorshuizen F, Krol A, Prins M, et al: Long-term outcome of chronic drug use: the Amsterdam Cohort Study among Drug Users. *American Journal of Epidemiology* 161:271-279, 2005
- Thomas CP, Fullerton CA, Kim M, et al: Medication-assisted treatment with buprenorphine. *Psychiatric Services*, 2013; doi 10.1176/appi.ps.201300256
- Galanter M, Kleber H (ed): *The American Psychiatric Publishing Textbook of Substance Abuse Treatment*, 4th ed. Arlington, Va, American Psychiatric Publishing, 2008
- D'Annunzio T, Folz-Murphy N, Lin X: Changes in methadone treatment practices: results from a panel study, 1988-1995. *American Journal of Drug and Alcohol Abuse* 25:681-699, 1999
- D'Annunzio T, Pollack HA: Changes in methadone treatment practices: results from a national panel study, 1988-2000. *JAMA* 288:850-856, 2002
- Dougherty RH, Lyman DR, George P, et al: Assessing the evidence base for behavioral health services: introduction to the series. *Psychiatric Services*, 2013; doi 10.1176/appi.ps.201300214
- Sees KL, Delucchi KL, Masson C, et al: Methadone maintenance for opioid dependence. *JAMA* 284:694-695, 2000
- Strain EC, Bigelow GE, Liebson IA, et al: Moderate- vs high-dose methadone in the treatment of opioid dependence: a randomized trial. *JAMA* 281:1000-1005, 1999
- Schwartz RP, Highfield DA, Jaffe JH, et al: A randomized controlled trial of interim methadone maintenance. *Archives of General Psychiatry* 63:102-109, 2006
- Schwartz RP, Kelly SM, O'Grady KE, et al: Interim methadone treatment compared to standard methadone treatment: 4-month findings. *Journal of Substance Abuse Treatment* 41:21-29, 2011
- Schwartz RP, Kelly SM, O'Grady KE, et al: Randomized trial of standard methadone

- treatment compared to initiating methadone without counseling: 12-month findings. *Addiction* 107:943-952, 2012
17. Wilson ME, Schwartz RP, O'Grady KE, et al: Impact of interim methadone maintenance on HIV risk behaviors. *Journal of Urban Health* 87:586-591, 2010
 18. Kandall SR, Doberczak TM, Jantunen M, et al: The methadone-maintained pregnancy. *Clinics in Perinatology* 26:173-183, 1999
 19. McCarthy JJ, Leamon MH, Parr MS, et al: High-dose methadone maintenance in pregnancy: maternal and neonatal outcomes. *American Journal of Obstetrics and Gynecology* 193:606-610, 2005
 20. Pizarro D, Habli M, Grier M, et al: Higher maternal doses of methadone does not increase neonatal abstinence syndrome. *Journal of Substance Abuse Treatment* 40: 295-298, 2011
 21. Mattick RP, Breen C, Kimber J, et al: Methadone maintenance therapy versus no opioid replacement therapy for opioid dependence. *Cochrane Database of Systematic Reviews* 3:CD002209, 2009
 22. Hall W, Ward J, Mattick R: *The Effectiveness of Methadone Maintenance Treatment I: Heroin Use and Crime*. Amsterdam, Harwood Academic Publishers, 1998
 23. Faggiano F, Vigna-Taglianti F, Versino E, et al: Methadone maintenance at different dosages for opioid dependence. *Cochrane Database of Systematic Reviews* 3:CD002208, 2003
 24. Fareed A, Casarella J, Amar R, et al: Methadone maintenance dosing guideline for opioid dependence, a literature review. *Journal of Addictive Diseases* 29:1-14, 2010
 25. MacArthur GJ, Minozzi S, Martin N, et al: Opiate substitution treatment and HIV transmission in people who inject drugs: systematic review and meta-analysis. *British Medical Journal* 345:e5945, 2012
 26. Gowing L, Farrell MF, Bornemann R, et al: Oral substitution treatment of injecting opioid users for prevention of HIV infection. *Cochrane Database of Systematic Reviews* 8:CD004145, 2011
 27. Fareed A, Vayalapalli S, Stout S, et al: Effect of methadone maintenance treatment on heroin craving, a literature review. *Journal of Addictive Diseases* 30: 27-38, 2011
 28. Connock M, Juarez-Garcia A, Jowett S, et al: Methadone and buprenorphine for the management of opioid dependence: a systematic review and economic evaluation. *Health Technology Assessment* 11:1-171, iii-iv, 2007
 29. Fletcher BW, Battjes RJ: Introduction to the special issue: treatment process in DATOS. *Drug and Alcohol Dependence* 57:81-87, 1999
 30. Amato L, Minozzi S, Davoli M, et al: Psychosocial combined with agonist maintenance treatments versus agonist maintenance treatments alone for treatment of opioid dependence. *Cochrane Database of Systematic Reviews* 10:CD004147, 2011
 31. Cleary BJ, Donnelly J, Strawbridge J, et al: Methadone dose and neonatal abstinence syndrome-systematic review and meta-analysis. *Addiction* 105:2071-2084, 2010
 32. Methadone-Associated Mortality: Report of a National Assessment, May 8-9, 2003. SAMHSA pub no 04-3904. Rockville, Md, Substance Abuse and Mental Health Services Administration, Center for Substance Abuse Treatment, 2004
 33. Webster LR, Cochella S, Dasgupta N, et al: An analysis of the root causes for opioid-related overdose deaths in the United States. *Pain Medicine* 12(Suppl 2): S26-S35, 2011
 34. Martin JA, Campbell A, Killip T, et al: Substance Abuse and Mental Health Services Administration: QT interval screening in methadone maintenance treatment: report of a SAMHSA expert panel. *Journal of Addictive Diseases* 30:283-306, 2011
 35. Modesto-Lowe V, Brooks D, Petry N: Methadone deaths: risk factors in pain and addicted populations. *Journal of General Internal Medicine* 25:305-309, 2010
 36. Jones HE, O'Grady KE, Malfi D, et al: Methadone maintenance vs. methadone taper during pregnancy: maternal and neonatal outcomes. *American Journal on Addictions* 17:372-386, 2008
 37. Kaltenbach K, Berghella V, Finnegan L: Opioid dependence during pregnancy. Effects and management. *Obstetrics and Gynecology Clinics of North America* 25: 139-151, 1998
 38. Hulse GK, Milne E, English DR, et al: The relationship between maternal use of heroin and methadone and infant birth weight. *Addiction* 92:1571-1579, 1997
 39. Finnegan L, Kaltenbach K: Neonatal abstinence syndrome; in *Primary Pediatric Care*. Edited by Hoekelman RA, Friedman SB, Nelson NM, et al. St Louis, Mo, Mosby-Year Book, 1992
 40. Ebner N, Rohrmeister K, Winklbaur B, et al: Management of neonatal abstinence syndrome in neonates born to opioid maintained women. *Drug and Alcohol Dependence* 87:131-138, 2007
 41. Dashe JS, Sheffield JS, Olscher DA, et al: Relationship between maternal methadone dosage and neonatal withdrawal. *Obstetrics and Gynecology* 100:1244-1249, 2002
 42. American Academy of Pediatrics Committee on Drugs: Neonatal drug withdrawal. *Pediatrics* 101:1079-1088, 1998
 43. Kaltenbach K, Finnegan LP: Developmental outcome of children born to methadone maintained women: a review of longitudinal studies. *Neurobehavioral Toxicology and Teratology* 6:271-275, 1984
 44. Jones HE, Kaltenbach K, Heil SH, et al: Neonatal abstinence syndrome after methadone or buprenorphine exposure. *New England Journal of Medicine* 363: 2320-2331, 2010

Not in My Back Yard: A Comparative Analysis of Crime Around Publicly Funded Drug Treatment Centers, Liquor Stores, Convenience Stores, and Corner Stores in One Mid-Atlantic City

C. DEBRA M. FURR-HOLDEN, PH.D.,^{a,*} ADAM J. MILAM, PH.D., M.H.S.,^{a,b} ELIZABETH D. NESOFF, M.P.H.,^c RENEE M. JOHNSON, PH.D.,^a DAVID O. FAKUNLE, B.A.,^a JACKY M. JENNINGS, PH.D., M.P.H.,^d & ROLAND J. THORPE, JR., PH.D.^c

^aDepartment of Mental Health, Bloomberg School of Public Health, The Johns Hopkins University, Baltimore, Maryland

^bSchool of Medicine, Wayne State University, Detroit, Michigan

^cDepartment of Health, Behavior, and Society, Bloomberg School of Public Health, The Johns Hopkins University, Baltimore, Maryland

^dCenter for Child and Community Health Research, Department of Pediatrics, The Johns Hopkins School of Medicine, Baltimore, Maryland

ABSTRACT. Objective: This research examined whether publicly funded drug treatment centers (DTCs) were associated with violent crime in excess of the violence happening around other commercial businesses. **Method:** Violent crime data and locations of community entities were geocoded and mapped. DTCs and other retail outlets were matched based on a Neighborhood Disadvantage score at the census tract level. Street network buffers ranging from 100 to 1,400 feet were placed around each location. Negative binomial regression models were used to estimate the relationship between the count of violent crimes and the distance from each business type. **Results:** Compared with the mean count of violent crime around drug treatment centers, the mean count of violent crime ($M = 2.87$) was significantly higher around liquor stores

($M = 3.98$; t test; $p < .01$) and corner stores ($M = 3.78$; t test; $p < .01$), and there was no statistically significant difference between the count around convenience stores ($M = 2.65$; t test; $p = .32$). In the adjusted negative binomial regression models, there was a negative and significant relationship between the count of violent crime and the distance from drug treatment centers ($\beta = -.069$, $p < .01$), liquor stores ($\beta = -.081$, $p < .01$), corner stores ($\beta = -.116$, $p < .01$), and convenience stores ($\beta = -.154$, $p < .01$). **Conclusions:** Violent crime associated with drug treatment centers is similar to that associated with liquor stores and is less frequent than that associated with convenience stores and corner stores. (*J. Stud. Alcohol Drugs*, 77, 17–24, 2016)

THE PHENOMENON KNOWN AS the “Not in My Back Yard,” or NIMBY, syndrome is characterized by neighborhoods’ resistance to having technologies, services, commercial outlets, housing developments, group housing programs, or other initiatives in their neighborhood. Although many residents may support these initiatives in theory, they are against having them located in their neighborhood (Davidson & Howe, 2014; Krause et al., 2014; Piat, 2000; Polcin et al., 2012; Takahashi, 1997). Polcin and colleagues (2012) examined community concerns about “sober living houses” (i.e., alcohol- and other drug-free living environments aimed to help residents maintain sobriety) and found that concerns centered on issues such as noise, traffic, violent crime, and unpleasant resident behavior. Other research highlights residents’ concerns about property values and quality of life (Piat, 2000).

Takahashi (1997) argues that NIMBY syndrome stems from stigmatization and disdain, particularly for services designed for special populations, such as people with substance use disorders and other mental health problems, people who have been involved in the criminal justice system, and people with insecure housing. NIMBY syndrome has been repeatedly observed in the placement of drug treatment centers (DTCs)—such as methadone clinics—as many believe that people in recovery are objectionable (Boyd et al., 2012; Polcin et al., 2012). Residents are particularly concerned about violence increasing in their neighborhoods subsequent to the establishment of behavioral health or housing initiatives for people with substance use disorders in their neighborhoods (Boyd et al., 2012; Davidson & Howe, 2014; Polcin et al., 2012; Takahashi, 1997).

Empirical data on whether DTCs are associated with increased levels of violence may provide information to (a) help communities make informed, data-driven decisions

Received: February 9, 2015. Revision: July 6, 2015.

This research was supported by National Institute on Drug Abuse Grant T32DA007292-23 (C. Debra Furr-Holden, principal investigator), the National Institute on Minority Health and Health Disparities Grant 5P60MD000214-14 to The Johns Hopkins Center for Health Disparities Center Solutions (Thomas LaVeist, principal investigator), and Centers for Disease Control and Prevention Center for the Prevention of Youth Violence

Grant 1U01CE001954-01A1 (Philip Leaf, principal investigator). Drug treatment data were provided by Baltimore Substance Abuse Systems. Food outlet data were provided by The Johns Hopkins Center for a Livable Future.

*Correspondence may be sent to C. Debra Furr-Holden at the Department of Mental Health, Bloomberg School of Public Health, 111 Market Place, Suite 850, Baltimore, MD 21202, or via email at: drholden@jhu.edu.

about whether to support such centers and (b) help advocates mitigate strong opposition with evidence as opposed to moral or rhetorical arguments. We, therefore, sought to empirically test whether publicly funded DTCs are associated with violence in excess of the violence happening around other commercial businesses by matching DTCs with other retail entities by neighborhood disadvantage and comparing the relative rate of crime around DTCs with crime around other business types. Other commercial businesses attract foot and vehicular traffic and have hours of operation inclusive of the standard hours of a DTC.

Method

This was a cross-sectional analysis comparing violent crime around DTCs to violent crime around similar community entities matched by neighborhood disadvantage in Baltimore, MD, in 2011. Similar community entities were selected if they operated in a residential or mixed residential/commercial zone, were open at least 8 hours per day 6 days per week, and were classified as commercial entities. Such locations included liquor stores, major chain convenience stores (e.g., 7-Eleven and Royal Farms), and “mom-and-pop” corner stores.

Violent crimes

Data on violent crimes in 2011 were obtained from the Baltimore City Police Department. These data included the address where the violent crime occurred and a description of the crime. Violent crimes include robbery, aggravated assault, rape, manslaughter, and homicide (Franklin et al., 2010). These are the Uniform Crime Report violent crime offenses reported to the Baltimore police and do not include arrests or calls for service. There were 9,378 violent crimes in 2011; most were aggravated assaults (53.9%) and robberies (40.9%). Respectively, 2.1% and 3.1% were homicides and sexual assaults. Ninety-nine percent of the violent crimes were geocoded in ArcMap Version 10 (ArcGIS, 2011). The remaining 1% of addresses were not geocoded because of missing addresses or because the addresses were illogical or invalid.

Counts of the number of violent crimes were calculated for each of the community entities in 100-foot buffer increments, from 0 feet to 1,400 feet (i.e., 0–100 feet, 101–200 feet, etc.). Boyd and colleagues (2012) used a similar distance (25 m or 82 feet) but went only as far as 300 m (equivalent to 984 feet or 0.19 miles). The current investigation extended that distance to a full quarter mile, a standard for walking distance in urban centers (Milam et al., 2013; Salbach et al., 2015). In addition, we summed the number of violent crimes for all sites within each category and divided by the number of sites to generate a mean number of violent crimes for DTCs, liquor stores, convenience stores, and cor-

ner stores. This allows for comparison of the mean level of violent crime across each of the different sites.

Drug treatment centers (n = 53)

Information on the presence of publicly funded outpatient DTCs was obtained from Baltimore Substance Abuse Systems, Inc. (BSAS), the City of Baltimore’s substance use disorder authority (the name has since been changed to “Behavioral Health Systems Baltimore”). Publicly funded DTCs in Baltimore receive funding for uninsured and underinsured clients through federal block grant dollars administered by BSAS. Data included the addresses of all licensed and operating drug treatment facilities in the city of Baltimore in 2011. To be counted as publicly funded DTCs, centers had to be licensed through the Maryland Alcohol and Drug Abuse Administration, receive federal block grant dollars through BSAS, and meet all federal and state regulations for such a facility.

Private DTCs were excluded from these analyses for two reasons. First, most do not receive any treatment block grant dollars (primarily because they take only patients who pay with cash or with private insurance), and they have different reporting requirements, making it more difficult to ascertain data on their locations. Second, they tend to be located in areas outside of Baltimore City and/or in locales that are not comparable to the neighborhoods that are of interest to this investigation. We found only three DTCs in Baltimore City that were excluded from this investigation because they were private.

There were 83 publicly funded DTCs in Baltimore. Five of those were located outside of Baltimore City boundaries and were excluded from these analyses. The remaining 78 DTCs were housed in 53 different locations. Twenty-two centers were co-located in the same building as one or two other DTCs (e.g., a separately run inpatient and outpatient program located in the same building). The unit of analysis for this work is the location of a DTC; therefore, when multiple DTCs were in a single location, we counted that as a single DTC site. Treatment programs included 37% outpatient and intensive outpatient treatment programs (including medication-assisted programs with buprenorphine and methadone); 29% halfway houses; 19% primarily opioid maintenance therapy programs; 9% medium-intensity residential programs; and 6% therapeutic communities, intermediate care facilities, or inpatient detox facilities.

Liquor stores (n = 476)

Data on all alcohol outlets were obtained from the Board of Liquor License Commissioners for Baltimore City. These data included the address and license type for all establishments licensed to sell alcohol in Baltimore City in 2011. There were 1,285 alcohol outlets, and 99% (1,277) of those

were geocoded in ArcMap Version 10. Locations without a valid address were not geocoded. We restricted this investigation to the 476 liquor stores that allow sales for both on- and off-premise alcohol consumption 7 days a week from 6 A.M. to 2 A.M.; these are classified by the Liquor Board as “BD-7” outlets, and we refer to them as *liquor stores* in this article. The following types of alcohol outlets were excluded: restaurants, nonprofit private clubs, arenas, hotels, and package goods stores that sell alcohol exclusively for off-premise consumption. BD-7 outlets are comparable to those with bar/tavern licenses in other states that have the capacity to also sell off-premise consumption package goods (e.g., Pennsylvania or Virginia).

Food stores

The addresses and facility names of all 803 package goods food stores from 2011 were obtained from the Baltimore City Health Department; all sell food intended for off-premise consumption. The food stores were classified into seven categories using the schema developed by The Johns Hopkins Center for a Livable Future (Haering & Franco, 2010). These include supermarkets ($n = 47$), small grocery stores ($n = 19$), corner stores ($n = 308$), convenience stores ($n = 195$), behind-the-glass corner stores ($n = 128$), pharmacy stores ($n = 51$), and discount stores ($n = 55$).

The investigation is restricted to corner stores, behind-the-glass stores, and convenience stores. The former two were combined into a single category because of the considerable overlap in their composition, offerings, and locations. Notably, some liquor stores are also food stores. For these analyses, any stores that sold alcohol and food for off-site consumption were classified as liquor stores to ensure mutual exclusivity across sites.

Corner stores and behind-the-glass stores ($n = 436$). Corner stores are generally independently owned and managed (i.e., they lack national franchise affiliation), have a limited supply network, do not have name recognition outside their neighborhood, and have fewer than five cashiers. Behind-the-glass stores are a subtype of corner stores that are found almost exclusively in Baltimore’s low-income African American neighborhoods. Access to goods is limited by Plexiglas serving as a barrier between the customers on one side and the cashiers and merchandise on the other. The barrier is considered a necessary safety measure by many store owners. Many corner stores have been converted to behind-the-glass stores in recent decades. Although some corner stores stock healthy food options, most do not. Typical items include ramen noodles, high-sodium canned goods, snack foods, sodas, and candy. Behind-the-glass stores have the lowest availability of healthy foods in Baltimore, as measured by the Healthy Food Availability Index ratings (Casagrande et al., 2011). After excluding food stores that were also liquor stores, there were 396 corner ($n = 281$) and

behind-the-glass stores ($n = 115$). For simplicity, we will refer to these types of food stores as *corner stores* throughout the rest of this article.

Convenience stores ($n = 195$). Convenience stores are franchises of nationally or regionally recognized stores but are much smaller than supermarkets and by definition have fewer than five cash registers. They generally have long hours of operation, well-established distribution systems, and name recognition beyond their immediate area (e.g., 7-Eleven and Royal Farms). Although the stores’ different locations are homogeneous in appearance, their offerings may vary greatly based on the socioeconomic and racial composition of the neighborhoods where they are located. Nine convenience stores were excluded because they were also liquor stores.

Matching sites by neighborhood disadvantage

Studies have consistently found an association between neighborhood-level disadvantage and violent crime (Franklin et al., 2010; Ross & Mirowsky, 2001). The presence of corner stores, liquor stores, and convenience stores is also associated with neighborhood-level disadvantage, (e.g., LaVeist & Wallace, 2000; Matheson et al., 2014), making it a potentially important confounding variable. To control for neighborhood disadvantage, we matched DTCs to convenience stores, corner stores, and liquor stores based on the “Neighborhood Disadvantage” score of the census tract in which they were located. This metric has been used in similar investigations examining relationships between alcohol outlets and violent crime in an urban center (Franklin et al., 2010; Ross & Mirowsky, 2001).

The Neighborhood Disadvantage score is calculated using census-tract level items. We used census data from the 2005–2009 American Community Survey (U.S. Census, 2009). The items used to create the index include the percentages of (a) adults 25 years or older with a college degree, (b) owner-occupied housing, (c) households with incomes below the federal poverty threshold, and (d) female-headed households with children. We used Ross & Mirowsky’s (2001) formula to generate the index: $\{[(c / 10 + d / 10) - (a / 10 + b / 10)] / 4\}$ (percentages are entered as whole numbers, not decimals).

Each one-unit increase in the Neighborhood Disadvantage score is equivalent to an increase of 10 percentage points for each component item of the index (Franklin et al., 2010; Jennings et al., 2014; Ross & Mirowsky, 2001). The total score has a possible range from -5 to +5, where -5 is very low/little disadvantage and +5 is very severe disadvantage. We trichotomized the Neighborhood Disadvantage score into low (<0.00), moderate (0.00–1.00), and high (>1.00). The cut points were based on the distribution of the study data across all venues. This trichotomy produced nearly equal tertiles.

A random number generator was used to match each of

the DTCs with comparison sites. Matching was conducted within each tier of neighborhood disadvantage (i.e., low, moderate, and high). There were fewer DTCs than liquor stores, corner stores, and convenience stores. We matched just one of each facility with each of the 53 DTCs based on the Neighborhood Disadvantage score.

Spatial analysis

The Network Analyst “create new service area” tool in ArcGIS was used to create network buffers around each site. Network buffers are based on the distance, accounting for navigating street networks. By contrast, a “straight-line” buffer would not account for street networks, highways, or buildings in calculating distance. Straight-line buffers will more often produce overestimates of events within a buffer, as the distance to navigate a street network, to go around a body of water (for example), is greater than an imaginary line that cuts across that body of water with a straight line. The service area tool allows creation of buffers that take these complexities into account. The buffers ranged from 101 to 200 feet around the outlet to 1,301 to 1,400 feet around the outlet, in 100-foot intervals. We did not include the 1- to 100-foot buffers in the regression models (described below) to remove crime occurring at the facility, because in these data, convenience stores, corner stores, and liquor stores had substantially more violent crime (e.g., robberies) occurring onsite compared with DTCs. The *t* test result for each venue compared with DTCs at the 0- to 100-foot buffer revealed a significant difference between the results for DTCs and convenience stores ($p = .013$) but not for corner stores and liquor stores. This most likely reflects the higher likelihood of convenience stores being robbed compared with the other venues.

We extended the buffers to 1,400 feet because a quarter mile (1,320 feet) is generally considered walking distance in urban centers (Milam et al., 2013; Salbach et al., 2015). The buffers were “non-overlapping,” meaning that each subsequent buffer excluded the area of the smaller buffer(s) nested inside of it. This also means that the amount of area within each buffer is not equal, because placing a buffer around a buffer creates a larger surface area for the subsequent buffer.

We used a methodology developed by Boyd and colleagues (2012) to determine the levels of violent crime around each site. The count of violent crimes for each buffer was determined using the “Spatial Join” tool, which appends data from two map layers using geographic location. We appended the layer with the location of DTCs, food stores, and liquor stores to the layer with counts of violent crime.

Statistical analysis

The purpose of this investigation was to assess the level of violent crime near DTCs and to compare it with the level

of violent crime near liquor stores, corner stores, and convenience stores. As a first step, we calculated the scores on the scale of neighborhood disadvantage and summarized them for each type of facility. Second, we matched DTCs to liquor stores, corner stores, and convenience stores by level of neighborhood disadvantage. The remaining analyses are restricted to the 53 DTCs and the 53 liquor stores, 53 corner stores, and 53 convenience stores that were randomly selected in the matching process.

We calculated the mean level of violent crime overall for each of the four types of facilities at each buffer level. We calculated the mean by summing the counts of violent events and dividing by the number of facilities ($n = 53$ for all four types of facilities). *T* tests were used to compare the mean count of violent crimes for all buffers around treatment centers to other facilities.

Because the outcome of interest, count of violent crimes, was consistent with a negative binomial distribution, we used negative binomial regression models to estimate the relationship between the count of violent crimes and the distance from each facility. The negative binomial regression model, rather than the Poisson regression model, also accounted for the overdispersion of violent crime (Byers et al., 2003; Long, 1997). The log area of each buffer was used as an offset to adjust for differences in buffer sizes, transforming the count of violent crimes to the density of violent crimes. A statistically significant positive slope (β) would indicate that crime increases as the distance from the facility increases. A variant of the Huber–White sandwich estimator of variance was used to obtain robust standard errors to account for clustering within facility (each facility included 14 buffers in the regression model). A statistically significant negative slope (β) would indicate that crime decreases as the distance from the facility increases (i.e., crime is highest closest to the facility, consistent with the facility being a “magnet for crime”). A slope of zero would indicate that violent crime does not significantly change as the distance from the facility increases, indicating that the facility is independent of the occurrence of crime. Incident rate ratios (IRRs) were used to convey the strength of association, allowing the rate of crime change for each buffer to be expressed as a percentage. Significant findings were reported for α levels below .05, and analyses were stratified by facility. An interaction term between facility and distance was used to determine whether there were statistically significant differences in the slope between facilities. Stata 11.0 (StataCorp LP, College Station, TX) was used for statistical analyses, including negative binomial regression modeling. All geocoding and spatial analyses were conducted using ArcGIS.

Sensitivity analysis

We performed sensitivity analysis to assess the potential impact of biases associated with the joint concerns of spatial

TABLE 1. Objective Neighborhood Disadvantage score and total number of retail entities

Variable	Drug treatment centers (n = 53)	Liquor stores (n = 476)	Corner stores (n = 396)	Convenience stores (n = 186)
Scale score, <i>M</i> (<i>SD</i>)	0.90, (1.41)	-0.23, (1.32)	0.62, (1.09)	0.00, (1.10)
Range	-2.78, 3.58	-2.85, 2.93	-2.78, 3.60	-2.41, 4.09
Category, ^a % (n)				
Low (<0.00)	26.4% (14)	51.1% (243)	25.0% (099)	47.3% (88)
Moderate (0.00–1.00)	20.8% (11)	30.0% (143)	36.1% (143)	37.1% (69)
High (>1.00)	52.8% (28)	18.9% (090)	38.9% (154)	15.6% (29)

^aThe total Neighborhood Disadvantage score has a possible range from -5 to +5, where -5 is very low/little disadvantage and +5 is very severe disadvantage.

autocorrelation and clustering. We checked for and detected spatial autocorrelation among DTCs using one large 1,400-foot buffer around each center (Moran's $I = 0.393, p < .001$). Two approaches were tested to address this issue. First, we excluded all venues that had a similar venue in any of the 14 100-foot buffers and reran the regression models. We reran the regression models using only these venues. A second approach that we tested was to include a covariate in the adjusted regression model for the number of similar venues in each of the 14 buffers for each venue type.

Results

Neighborhood disadvantage and matching

Table 1 shows the number of DTCs, liquor stores, corner stores, and convenience stores by level of neighborhood disadvantage for the total sample of facilities. The Neighborhood Disadvantage score for all the facilities ranged from -2.41 to 4.09. DTCs and corner stores had the highest mean disadvantage score; 52.8% of DTCs were in high-disadvantage census tracts. After we matched facilities on Neighborhood Disadvantage score, the resultant analytic sample had similar mean Neighborhood Disadvantage scores

across facilities, minimizing the likelihood of confounding by neighborhood characteristics.

Mean level of violent crime

The mean count of violent crimes was calculated for each buffer and facility type (Table 2). Mean counts of violent crime, averaged across all buffers in rank order, were liquor stores (3.98), corner stores (3.78), treatment centers (2.87), and convenience stores, (2.65). The mean count of violent crime was significantly higher around liquor stores (*t* test; $p < .01$) and corner stores (*t* test; $p < .01$) compared with DTCs, and there was no statistically significant difference between convenience stores and DTCs ($p = .32$).

Negative binomial regression results

Negative binomial regression models were used to estimate the association between the violent crime count and the distance from each facility (Table 3). There was a negative association with violent crime for each facility: Namely, there was a high likelihood of violence occurring closer to each venue, and violence decreased as you moved away

TABLE 2. Mean number of violent crimes by distance from facility (independent of surface area)

Distance, feet	Drug treatment centers <i>M</i> (<i>SD</i>)	Liquor stores <i>M</i> (<i>SD</i>)	Corner stores <i>M</i> (<i>SD</i>)	Convenience stores <i>M</i> (<i>SD</i>)
1–100	0.92 (1.72)	1.68 (2.64)	1.57 (1.86)	2.06 (3.09)
101–200	0.87 (1.99)	2.17 (4.36)	0.74 (1.27)	0.66 (1.95)
201–300	1.25 (2.11)	1.79 (3.65)	1.96 (3.25)	1.36 (2.87)
301–400	1.26 (2.41)	1.75 (3.06)	2.53 (3.90)	1.15 (2.72)
401–500	2.28 (3.53)	2.70 (4.32)	2.89 (3.52)	3.08 (5.47)
501–600	1.53 (2.32)	3.55 (3.59)	3.17 (3.73)	2.64 (4.91)
601–700	2.83 (4.27)	3.13 (3.63)	3.09 (3.73)	2.34 (3.33)
701–800	2.94 (4.56)	3.55 (4.10)	3.83 (4.37)	2.30 (3.61)
801–900	4.00 (4.78)	4.70 (5.54)	3.92 (4.21)	3.94 (4.26)
901–1,000	3.66 (5.39)	4.72 (4.71)	4.75 (4.25)	2.94 (5.10)
1,001–1,100	4.06 (4.84)	4.75 (4.76)	4.57 (5.60)	4.13 (4.14)
1,101–1,200	4.79 (5.90)	5.94 (7.19)	6.08 (7.21)	2.98 (4.91)
1,201–1,300	5.25 (5.13)	7.57 (8.94)	5.85 (5.57)	3.94 (4.59)
1,301–1,400	4.51 (5.68)	7.75 (8.89)	7.98 (11.67)	3.53 (4.29)
Grand mean (<i>SD</i>)	2.87 (4.38)	3.98 (5.62)	3.78 (5.46)	2.65 (4.17)
<i>t</i> test		-4.26 ($p < .01$) ^a	-3.54 ($p < .01$) ^a	1.00 ($p = .32$) ^a

Notes: $n = 53$ for all types of facilities. ^a*p* value for two-sided *t* test comparing violent crime around facility to treatment centers.

TABLE 3. Incident rate ratios (IRRs) from negative binomial regression (per 100 feet) for the association between violent crime count and distance from each retail entity

Variables	IRR	[95% CI]	<i>p</i>
Treatment centers	0.968	[0.938, 0.998]	.037
Liquor stores	0.944	[0.917, 0.972]	<.001
Corner stores	0.963	[0.941, 0.985]	.001
Convenience stores	0.934	[0.898, 0.972]	.001

Notes: From negative binomial regression, in 100 foot increments, minus first buffer controlling for surface area. CI = confidence interval.

from the venue. This indicates that, in general, crime was happening at a greater rate proximal to each of the venues. This relationship was the strongest for liquor stores and convenience stores. For each 100-foot increase in buffer distance away from liquor stores and convenience stores, there was a 5.6% and 6.6% decrease in crime, respectively (IRR = 0.944, $p < .001$; IRR = 0.934, $p < .001$). The relationship was similar, but smaller, for corner stores. For each 100-foot increase in buffer distance away from corner stores, there was a 3.7% decrease in violent crime (IRR = 0.963, $p = .001$). DTCs had the largest IRR, indicating the slowest drop-off in violent crime as you move away from the venue. There was a 3.2% decrease in the average predicted count of violent crimes for each 100-foot increase in buffer distance away from DTCs (IRR = 0.968, $p = .037$).

All of the facility types were included in the same model to test for interactions between facility type and buffer distance. There were no significant differences in IRR between treatment centers and any venues, indicating that the rate of change in crime as you move away from these venues was not statistically different.

Sensitivity analysis

The resultant sample from our first sensitivity analysis of excluding overlapping outlets included 24 DTCs that had no other DTCs in any of the buffers, 19 convenience stores that had no other convenience stores in any of the buffers, and 16 liquor stores and 17 corner stores that fit similar criteria. We reran the regression models using only these venues. The results were similar in magnitude and direction. For example, the IRR for DTCs in the model with the full sample ($n = 53$) was 0.933 ($p < .01$). In the reduced sample with only DTCs without overlap ($n = 24$), the IRR was 0.924 ($p = .03$). These findings were consistent across all venue types. The second approach, which included a covariate in the adjusted regression model for the number of similar venues in each of the 14 buffers for each venue type, showed that the range of DTCs within each buffer was between 0 and 2, with a mean of 0.136. We reran the regression models adjusting for the count within each buffer. The resulting IRR for DTCs was 0.968 ($p = .036$)—nearly identical to the models without adjustment.

These results were mirrored in the analysis of the other venue types (e.g., adjusted IRR = 0.953, $p < .001$, for corner stores vs. 0.963, $p < .001$, unadjusted). We opted not to use these estimates as the final reported results even though they were statistically adjusted for the clustering of the same venues. We made this decision for several reasons. First, there are substantially more of the other types of venues than DTCs (Table 1). Second, these adjustments do not take into account the other types of venues that may also be within the buffers that may affect violent crime rates. Most importantly, the goal of the sensitivity analyses was to assess the validity of our results; as the results were very similar, it suggests that our initial approach was valid.

Discussion

NIMBYism poses a significant threat to vital behavioral health services being located in communities. The current investigation sought empirical evidence for whether DTCs were associated with violent crime in excess of the violence occurring around other retail entities located within communities—namely, liquor stores, corner stores, and convenience stores. If DTCs, in fact, do pose a unique threat to communities as magnets for crime, we would have found higher rates of crime closer to the DTCs compared with the other entities. We would also have found statistically significant differences in the rate of change in crime farther from (or closer to) the venue. We empirically tested these relationships and found no statistical evidence that DTCs specifically attract violent crime. The estimated means of violent crime showed a decrease in crime as you move away from each of the venue types, even after the increasing size of the buffer was controlled for.

This implies that all of the venues to some degree are located in sites where violent crime occurs. However, there was significant variation in the magnitude of this effect, with DTCs having the smallest rate of crime proximal to the venue, and corner stores, liquor stores, and convenience stores having an increasingly larger magnetic effect on violent crime. These data suggest that businesses in general tend to attract crime, but this effect is less pronounced for DTCs than for the other locales we studied. Commercial businesses tend to be in areas with greater foot traffic, vehicle traffic, and routine activity, creating both cover for and opportunity for crime.

As an alternative explanation, it is possible that each of these venues has a different spatial function to crime. The area of impact could be greater or smaller, depending on the venue and whether its patrons are mostly residents of the community or come from outside the community. In addition, we found a larger magnetic effect for non-DTC venues, specifically convenience stores at the 0- to 100-foot buffer range (equivalent to events inside the venue or immediately outside the venue). These findings most likely reflect

the higher likelihood of convenience stores being robbed compared with the other venues. Understanding and better clarifying the mechanisms underlying this association is an area for inquiry in future research.

The estimated mean of violent crime was significantly higher for liquor stores and corner stores compared with that for DTCs, but there was no mean difference in the rate of crime change as you moved away from corner stores. Behind-the-glass and corner stores are concentrated in higher disadvantage neighborhoods, and it is possible that they are simply located in communities where crime is endemic and independent of their presence. We matched venues on neighborhood disadvantage to constrain this potential bias, but it is possible that some within-neighborhood variation still remained. In contrast, liquor stores had elevated mean rates of crime compared with all the other venue types, and the rate of decrease in crime as you moved away from liquor stores was significantly faster than it was for corner stores and treatment centers. This supports the notion that liquor stores are magnets for crime and is consistent with the results of other published studies that have found associations between the presence of liquor stores and elevated rates of violent crime proximal to the store (Gruenewald & Remer, 2006; Jennings et al., 2014; LaVeist & Wallace, 2000; Lipton et al., 2013; Scribner et al., 1995).

Before further discussion of these results, a few limitations merit mention. First, there was some evidence of confounding with convenience stores by neighborhood advantage, but we addressed that as best we could with matching. Second, we did not control for other venue types within each of the buffers, such that it was possible, for example, that a DTC had a liquor store in one of its buffers. There was such a large number of venues, however, that we opted to randomly select venues and match them to DTCs based on Neighborhood Disadvantage scores to minimize potential confounding. Random selection was the best approach here to ensure that, if there was some spatial overlap, it would be evenly distributed. To test this hypothesis, we conducted sensitivity analyses—namely, we excluded venues with overlap within any of the buffers and in a separate model adjusted for similar venues within the buffer; the results remained consistent. Last, our study design was focused on contrasting DTCs with other community businesses, but we found interesting results pointing to liquor stores as potential crime attractors. Future investigations will further explore this relationship using the full range of alcohol outlet data, and further research is needed to establish the causal link between liquor stores and crime.

In conclusion, DTCs have an unfairly poor reputation as being magnets for crime and a threat to community safety that is not backed up by empirical evidence. By contrast, other community businesses that have a more pronounced magnetic effect on crime are often solicited by communities to locate within their neighborhoods. Future investigations

should include a more comprehensive examination of the synergistic effect of having multiple venue types within a defined geographic area, as well as incorporate a broad range of community perspectives to balance the empirical data with residential experiences.

References

- ArcGIS: Release 10. (2011). Redlands, CA: ESRI.
- Boyd, S. J., Fang, L. J., Medoff, D. R., Dixon, L. B., & Gorelick, D. A. (2012). Use of a 'microecological technique' to study crime incidents around methadone maintenance treatment centers. *Addiction, 107*, 1632–1638. doi:10.1111/j.1360-0443.2012.03872.x.
- Byers, A. L., Allore, H., Gill, T. M., & Peduzzi, P. N. (2003). Application of negative binomial modeling for discrete outcomes: A case study in aging research. *Journal of Clinical Epidemiology, 56*, 559–564. doi:10.1016/S0895-4356(03)00028-3.
- Casagrande, S. S., Franco, M., Gittelsohn, J., Zonderman, A. B., Evans, M. K., Fanelli Kuczmarowski, M., & Gary-Webb, T. L. (2011). Healthy food availability and the association with BMI in Baltimore, Maryland. *Public Health Nutrition, 14*, 1001–1007. doi:10.1017/S1368980010003812.
- Davidson, P. J., & Howe, M. (2014). Beyond NIMBYism: Understanding community antipathy toward needle distribution services. *International Journal on Drug Policy, 25*, 624–632. doi:10.1016/j.drugpo.2013.10.012.
- Franklin, F. A., II, LaVeist, T. A., Webster, D. W., & Pan, W. K. (2010). Alcohol outlets and violent crime in Washington, D.C. *Western Journal of Emergency Medicine, 11*, 283–290.
- Gruenewald, P. J., & Remer, L. (2006). Changes in outlet densities affect violence rates. *Alcoholism: Clinical and Experimental Research, 30*, 1184–1193. doi:10.1111/j.1530-0277.2006.00141.x.
- Haering, S. A., & Franco, M. (Eds.). (2010). *The Baltimore City Food Environment*. Baltimore, MD: Center for a Livable Future, The Johns Hopkins School of Public Health.
- Jennings, J. M., Milam, A. J., Greiner, A., Furr-Holden, C. D. M., Curriero, F. C., & Thornton, R. J. (2014). Neighborhood alcohol outlets and the association with violent crime in one mid-Atlantic City: The implications for zoning policy. *Journal of Urban Health, 91*, 62–71. doi:10.1007/s11524-013-9821-z.
- Krause, R. M., Carley, S. R., Warren, D. C., Rupp, J. A., & Graham, J. D. (2014). "Not in (or under) my backyard": Geographic proximity and public acceptance of carbon capture and storage facilities. *Risk Analysis, 34*, 529–540. doi:10.1111/risa.12119.
- LaVeist, T. A., & Wallace, J. M., Jr. (2000). Health risk and inequitable distribution of liquor stores in African American neighborhood. *Social Science & Medicine, 51*, 613–617. doi:10.1016/S0277-9536(00)00004-6.
- Lipton, R., Yang, X., Braga, A. A., Goldstick, J., Newton, M., & Rura, M. (2013). The geography of violence, alcohol outlets, and drug arrests in Boston. *American Journal of Public Health, 103*, 657–664. doi:10.2105/AJPH.2012.300927.
- Long, J. S. (1997). *Regression models for categorical and limited dependent variables*. Thousand Oaks, CA: Sage.
- Matheson, F. I., Creatore, M. I., Gozdyra, P., Park, A. L., & Ray, J. G. (2014). A population-based study of premature mortality in relation to neighbourhood density of alcohol sales and cheque cashing outlets in Toronto, Canada. *BMJ Open, 4*, e006032. doi:10.1136/bmjopen-2014-006032.
- Milam, A. J., Furr-Holden, C. D., Bradshaw, C. P., Webster, D. W., Cooley-Strickland, M. C., & Leaf, P. J. (2013). Alcohol environment, perceived safety, and exposure to alcohol, tobacco, and other drugs in early adolescence. *Journal of Community Psychology, 41*, 867–883. doi:10.3109/10826084.2013.817426.

- Piat, M. (2000). The NIMBY phenomenon: Community residents' concerns about housing for deinstitutionalized people. *Health & Social Work, 25*, 127-138. doi:10.1093/hsw/25.2.127.
- Polcin, D. L., Henderson, D., Trocki, K., Evans, K., & Wittman, F. (2012). Community context of sober living houses. *Addiction Research & Theory, 20*, 480-491. doi:10.3109/16066359.2012.665967.
- Ross, C. E., & Mirowsky, J. (2001). Neighborhood disadvantage, disorder, and health. *Journal of Health and Social Behavior, 42*, 258-276. doi:10.2307/3090214.
- Rossen, L. M., Pollack, K. M., Curriero, F. C., Shields, T. M., Smart, M. J., Furr-Holden, C. D. M., & Cooley-Strickland, M. (2011). Neighborhood incivilities, perceived neighborhood safety, and walking to school among urban-dwelling children. *Journal of Physical Activity & Health, 8*, 262-271.
- Salbach, N. M., O'Brien, K. K., Brooks, D., Irvin, E., Martino, R., Takhar, P., . . . Howe, J. A. (2015). Reference values for standardized tests of walking speed and distance: A systematic review. *Gait & Posture, 41*, 341-360. doi:10.1016/j.gaitpost.2014.10.002.
- Scribner, R. A., MacKinnon, D. P., & Dwyer, J. H. (1995). The risk of assaultive violence and alcohol availability in Los Angeles County. *American Journal of Public Health, 85*, 335-340. doi:10.2105/AJPH.85.3.335.
- Takahashi, L. M. (1997). The socio-spatial stigmatization of homelessness and HIV/AIDS: Toward an explanation of the NIMBY syndrome. *Social Science & Medicine, 45*, 903-914. doi:10.1016/S0277-9536(96)00432-7.
- United States Census Bureau. (2009). *American Community Survey 5-year estimates: 2005-2009*. Retrieved from <http://www.census.gov/programs/surveys/acs/data/summary-file.2009.html>

Regional Judicial Opioid Summit

Tennessee Delegation

Tennessee State Representative Andrew Farmer, Chairman of the House of Representatives Criminal Justice Subcommittee

Honorable Duane Slone, Circuit Court Judge for the 4th Judicial District who also presides over the recovery court there,

Honorable Jimmy B. Dunn, District Attorney General for the 4th Judicial District, President of the Tennessee District Attorney Generals Conference

Special Agent in Charge Tommy Famer, Director of the Statewide Dangerous Drugs Task Force,

Honorable Shayne Sexton, Circuit Court Judge for the 8th Judicial District and presiding judge for the recovery court in that district,

Dr. Stephen Loyd, Medical Director for Substance Abuse Services, Department of MHSAS,

Dr. Kenneth Williams, Medical Director, Department of Corrections

Dr. Tara Sturdivant, Regional Medical Director, Department of Health

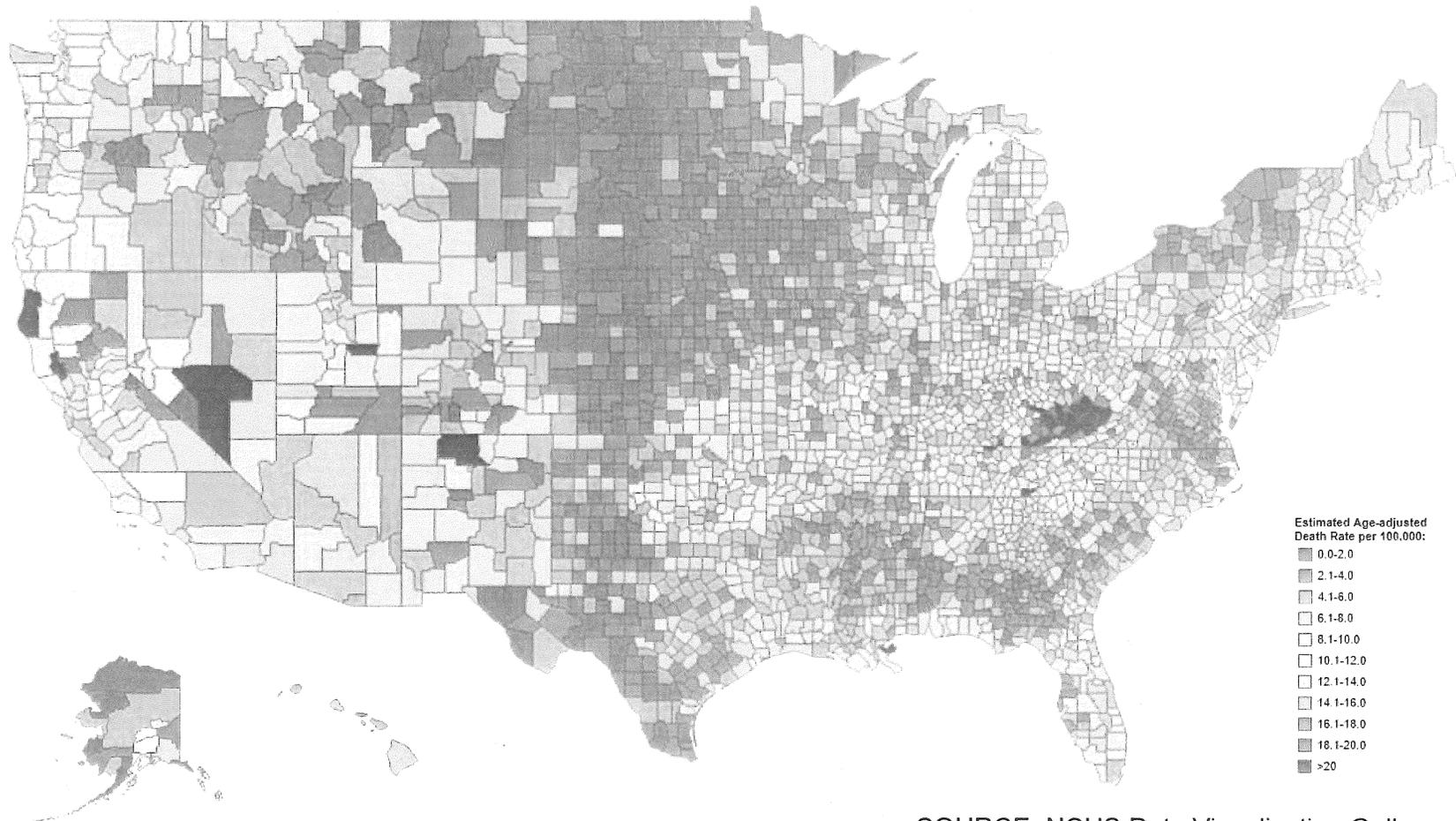
William Pierce Beckham, Deputy Director of Investigations, DCS

April Snell, Regional Director, DCS

Mary Linden Salter, Executive Director, Tennessee Association of Alcohol, Drug, and Other Addiction Services, aka TAADAS

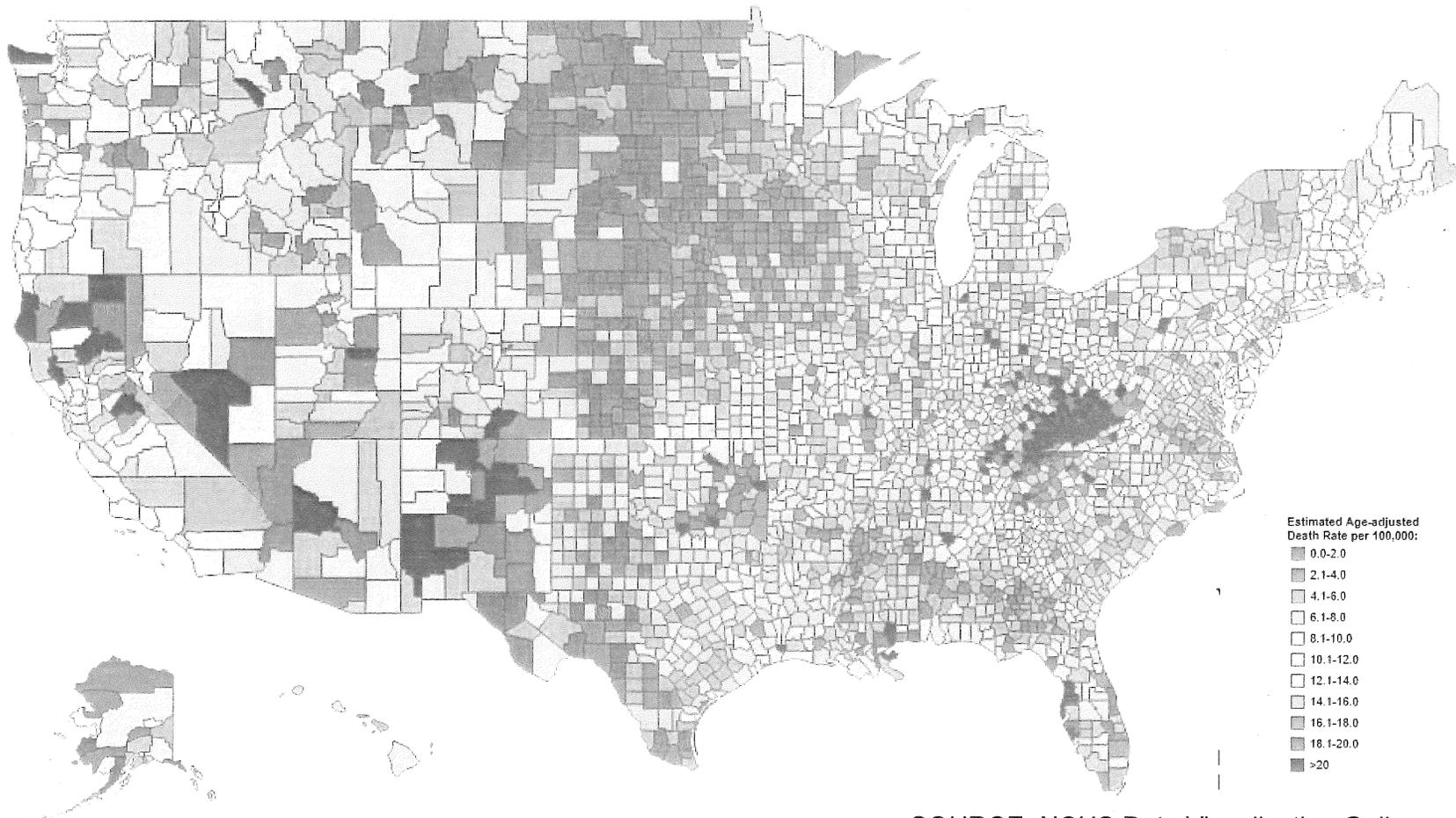
Dr. Marie Crosson, Executive Director, Tennessee Association of Drug Court Professionals

2002 Rapid Increase in Drug Overdose Death Rates by County



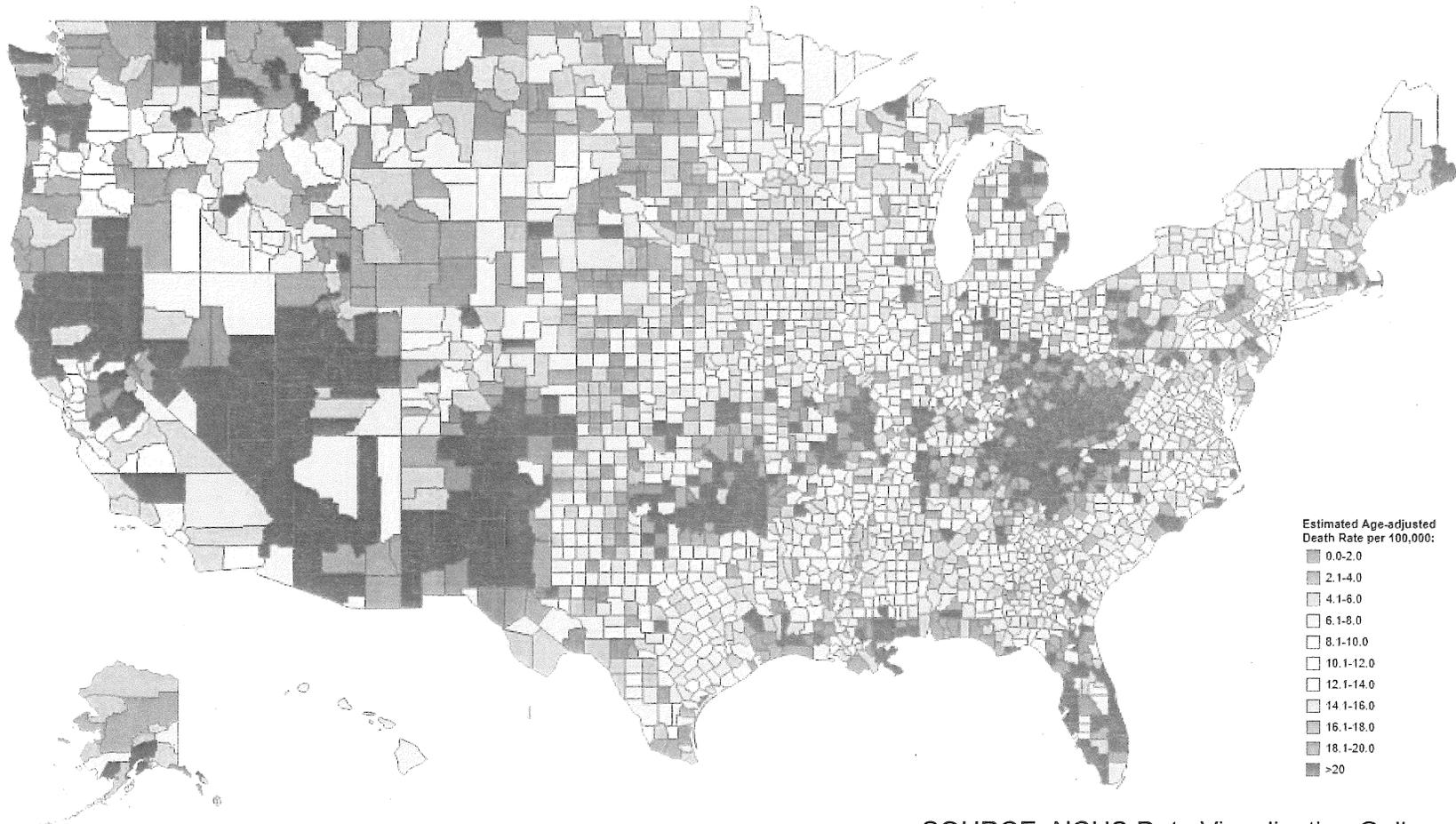
SOURCE: NCHS Data Visualization Gallery

2007 Rapid Increase in Drug Overdose Death Rates by County



SOURCE: NCHS Data Visualization Gallery

2014 Rapid Increase in Drug Overdose Death Rates by County



SOURCE: NCHS Data Visualization Gallery

G.O.C. STAFF RULE ABSTRACT

AGENCY: Tennessee Auctioneer Commission

SUBJECT: Auctioneer Duties, Licenses, and Auctions; Civil Penalties; and Fees

STATUTORY AUTHORITY: Tennessee Code Annotated, Section 62-19-106

EFFECTIVE DATES: December 16, 2016 through June 30, 2017

FISCAL IMPACT: Minimal

STAFF RULE ABSTRACT:

Amendment to Rule 0160-01-.01 Duties of an Auctioneer: This amendment will number the existing paragraph within the rule as paragraph (1) and add a new paragraph (2) which will state that a licensed auctioneer shall not accept offers for hire to call bids at any auction held by an auction house, auction barn, or auction gallery that is not the holder of valid auction gallery license.

Amendment to Rule 0160-01-.05 Publication of Name: This amendment will change the reference to "sponsoring auctioneer" and "auctioneer" within the existing rule to instead reference the "principal auctioneer."

Amendment to Rule 0160-01-.11 Civil Penalties: This amendment will add a civil penalty range of 0-\$1,000 to violations of T.C.A. § 62-19-125(a) and (b) as well as any Commission rule or order. The amendment also adds a provision stating that each day of a continued violation may constitute a separate violation.

Amendment to Rule 0160-01-.14 Fees: This amendment will delete a paragraph which provided for a penalty fee of one hundred dollars (\$100.00) for any notification of change of information which is made to the Commission more than sixty days after the effective date of the new information.

Amendment to Rule 0160-01-.16 Non-Auctioneer Firm License Application: This amendment will specify that any non-auctioneer owned firm must register one licensed auctioneer who will serve as the firm's principal auctioneer and must attend and accept responsibility for all auctions. The amendment further states that the Commission must be notified within ten days of the absence of the non-

auctioneer owned firm's principal auctioneer, and a new principal auctioneer must be in place (and the Commission notified) on or before thirty days have passed. The amendment specifies that no auctions shall be conducted by the nonauctioneer owned firm until a new principal auctioneer is placed.

Amendment to Rule 0160-01-.24 Notification of Change of Information: This amendment adds a new paragraph (2) which states that the Commission must be notified within ten days of the absence of a firm's principal auctioneer, and a new principal auctioneer must be in place (and the Commission notified) on or before thirty days have passed.

New Rule 0160-01-.26 Escrow Account Requirement: This proposed new rule states that all auction firms and galleries must have an escrow or trustee account for all funds which are held which belong to others as a result of an auction sale.

New Rule 0160-01-.27 Livestock Auction Sales: This proposed new rule states that the licensing exemption found within T.C.A. § 62-19-103 does not apply to any livestock auction which is not registered and regulated by the packers and stockyards administration. Further, this proposed new rule states that if a registered livestock auction facility also sells additional items at a regulated auction and the proceeds are deposited into a packers and stockyards account, then no firm or gallery license is necessary, but the person conducting the auction must hold an auctioneer's license. Finally, this proposed new rule states that if a regulated livestock auction conducts merchandise, equipment, or personal property auctions which are not held during a livestock auction, then the facility must have a firm or gallery license, and the person conducting said auction must have an auctioneer's license.

New Rule 0160-01-.28 Online Auctions: This proposed new rule states that if the time for a fixed time online only auction is extended beyond the stated ending time, then the auction and the person conducting the auction are no longer included in the licensing exemption found at T.C.A. § 62-19-103.

New Rule 0160-01-.29 Military Applicants: This proposed new rule provides for the expedited processing of applications for certain military personnel and their spouses, the recognition of education earned through military service, and the allowance of license renewal for

six months from the release from active duty without penalty when certain specified circumstances are met.

Public Hearing Comments

One copy of a document containing responses to comments made at the public hearing must accompany the filing pursuant to T.C.A. § 4-5-222. Agencies shall include only their responses to public hearing comments, which can be summarized. No letters of inquiry from parties questioning the rule will be accepted. When no comments are received at the public hearing, the agency need only draft a memorandum stating such and include it with the Rulemaking Hearing Rule filing. Minutes of the meeting will not be accepted. Transcripts are not acceptable.

Comment 1

Rule 0160-01-.26 (Escrow Account Requirement)

There was a comment asking if the Commission would consider authorizing a waiver of the proposed escrow account requirement for licensees who do not handle funds that belong to others if such licensees filled out a form proscribed by the Board swearing or affirming that they do not handle client funds.

Agency Response to Comment 1: The agency stated that, although it appreciated the comment and might not be opposed in principle to such a waiver, it does not believe it has the legal authority to grant such a waiver. Therefore, the agency declined to amend the proposed rule language for Rule 0160-01-.26 as set forth in the Notice of Rulemaking Hearing in any way.

Comment 2

Rule 0160-01-.01 (Duties of Auctioneer)

There was a comment stating that, in Rule 0160-01-.01(1), that the pronoun "his" that appears in the rule is not appropriately gender neutral because the rule uses "his" instead of "his or her". The commenter asked if the Commission would consider amending its rules to use gender neutral pronouns where appropriate.

Agency Response to Comment 2: The agency agreed with the commenter and voted to change the language in Rule 0160-01-.01(1) from "his" to "his or her". The agency further stated that, in the future, if it is made aware of other instances of pronouns in its rules which are not appropriately gender neutral, it will address any such instances as necessary at that time.

Comment 3

Rule 0160-01-.24 (Notification of Change of Information)

There was a comment stating that the current Rule 0160-01-.24 allows for 60 days for a licensee to notify the Commission in writing of any information previously submitted to the Commission by the licensee. The commenter noted that proposed Rule 0160-01-.24(2) would only allow an auctioneer firm thirty (30) days to replace a principal auctioneer and to notify the Board in writing regarding that replacement. The commenter stated that he believes that 30 days is too short a time to recruit and hire a new principal auctioneer, and he asked if the Commission would consider leaving the current rule allowing 60 days to replace a principal auctioneer in place and not adopting the new 30 day replacement and notification period.

Agency Response to Comment 3: The agency stated that, although it appreciated the commenter's perspective, it believes that a principal auctioneer can be replaced in 30 days and that the Tennessee Real Estate Commission has a similar replacement and notification time frame in place that seems to work well. Accordingly, the agency declined to amend the proposed rule language for Rule 0160-01-.24(2) as set forth in the Notice of Rulemaking Hearing in any way.

Comment 4

Rule 0160-01-.28 (Online Auctions)

There was a comment asserting that the legislative intent behind T.C.A. § 62-19-103(9) regarding the exemption of online auctions with a fixed time ending was to take a "hands off" approach to online auctions, and as such, that even online auctions which allow for extensions of the bidding time should qualify for the exemption for online auctions set forth in T.C.A. § 62-19-103(9). Based on that assertion, the commenter requested that the Board not adopt proposed Rule 0160-01-.28, or in the alternative, that the Commission work with the legislature to codify any language regarding the exemption of online auctions directly into the Auctioneer statute.

Agency Response to Comment 4: The agency stated that, although it appreciated the commenter's opinion, it believes that the Auctioneer statute only authorizes an exemption for online auctions which have a fixed time ending. The Commission also made reference to Attorney General's Opinion 06-053 (issued March 27, 2006), which appears to hold that online auctions are exempt from the requirements of the Auctioneer statute, in part, because such auctions have a fixed time ending. Accordingly, the agency declined to amend the proposed rule language for Rule 0160-01-.28 as set forth in the Notice of Rulemaking Hearing in accordance with the commenter's suggestions.

Comment 5

Rule 0160-01-.26 (Escrow Account Requirement)

There was a comment requesting that the Commission consider amending certain language of proposed Rule 0160-01-.26, which, as set forth in the Notice of Rulemaking Hearing, reads as follows: "All licensed auction firms and galleries shall maintain an escrow or trustee account for all funds that belong to others but which are held by the firm or gallery as a result of an auction sale." Specifically, the commenter requested that the Commission change the word "all" to "any", that the Commission change the word "sale" to "contract or sale", and that the Commission change the words "but which are held by" to "coming into the possession of the firm or gallery".

Agency Response to Comment 5: The agency stated that it believes that the words "all" and "sale" are clear, appropriate, and accurately reflect the agency's regulatory authority as granted by the Auctioneer statute. As such, the Commission declined to make those two changes as requested by the commenter. However, the Commission agrees with the commenter that the words "coming into the possession of the firm or gallery" are clearer and more accurate than the words "but which are held by". Therefore, the Commission voted to amend proposed Rule 0160-01-.26 to read as follows: "All licensed auction firms and galleries shall maintain an escrow or trustee account for all funds that belong to others coming into the possession of the firm or gallery as a result of an auction sale."

Comment 6

Rule 0160-01-.27 (Livestock Auction Sales)

There was a comment requesting that the Commission consider striking (3) of proposed Rule 0160-01-.27 as set forth in the Notice of Rulemaking Hearing, which reads as follows: "If the operator of a livestock auction sale that is registered with and regulated by the Packers & Stockyards Administration sells any items other than livestock at a regulated livestock auction and the proceeds are deposited into the shipper's proceeds account, then neither a Tennessee auction firm nor a Tennessee auction gallery is required. Any such auction must still be conducted by a Tennessee licensed auctioneer." The commenter expressed concern that this language would allow livestock auctioneers to auction personal property without being appropriately licensed by the Commission, thereby creating a risk of harm to the public if livestock auctioneers were allowed to auction personal property without being properly licensed.

Agency Response to Comment 6: The agency stated that it agrees with the commenter's concerns. Accordingly, the Commission voted to strike paragraph (3) from proposed Rule 0160-01-.27 and to renumber paragraphs (4) and (5) as paragraphs (3) and (4).

Comment 7

Rule 0160-01-.28 (Online Auctions)

There was a comment requesting that, for the sake of grammatical correctness, the Commission consider amending the language of proposed Rule 0160-01-.28 as set forth in the Notice of Rulemaking Hearing, which reads as follows: "If the time for an online only auction with a fixed bidding time is extended beyond the online auction's fixed ending time, then the auction and the person conducting the auction are not included within the exemption specified at T.C.A. § 62-19-103, and the statutes and rules of the Tennessee Auctioneer Commission shall govern the online auction." The commenter requested that proposed Rule 0160-01-.28 be amended to read as follows: "If the time for an online-only auction with a fixed-bidding time is extended beyond the fixed-ending time of the online-only auction, then the auction and the person conducting the auction are not included within the exemption specified at T.C.A. § 62-19-103(9), and the statutes and rules of the Tennessee Auctioneer Commission shall govern the online auction."

Agency Response to Comment 7: The agency stated that it agrees with the commenter, and voted to amend

the language of proposed Rule 0160-01-.28 as requested by the commenter.

Comment 8

Rule 0160-01-.01 (Duties of Auctioneer)

There was a comment requesting that the Commission speak to the necessity and scope of proposed Rule 0160-01-.01(2) as set forth in the Notice of Rulemaking Hearing, which reads as follows: "No licensed auctioneer shall accept offers for hire to call bids at any auction held by an auction house, auction barn, or auction gallery that is not either: (a) owned and operated by a licensed auctioneer holding a valid firm license; or (b) licensed as a gallery pursuant to the provisions of T.C.A. § 62-19-125."

Agency Response to Comment 8: The agency stated that the authority for this proposed rule is T.C.A. § 62-19-125, which states that a licensed auctioneer may only call bids at a licensed auction firm or a licensed gallery. The commenter stated that she now understands the language of this proposed rule more clearly, and that she does not have any suggested changes to the proposed rule.

Comment 9

Rule 0160-01-.26 (Escrow Account Requirement)

There was a comment requesting that the Commission consider amending the language of proposed Rule 0160-01-.26 as set forth in the Notice of Rulemaking Hearing, which reads as follows: "All licensed auction firms and galleries shall maintain an escrow or trustee account for all funds that belong to others but which are held by the firm or gallery as a result of an auction sale." The commenter requested that the Commission add language from T.C.A. § 62-19-112(b)(4) such that proposed Rule 0160-01-.26 reads as follows: "All licensed auction firms and galleries shall maintain an escrow or trustee account for all funds that belong to others but which are held by the firm or gallery as a result of an auction sale, provided, however, that nothing in this section shall be construed to require an auto auction as defined in § 55-17-102(2)(A) to maintain or use an escrow account when the auction does not accept and deposit funds of others."

Agency Response to Comment 9: The agency stated that T.C.A. § 62-19-112(b)(4) is sufficiently clear to provide notice to the public and to auctioneer licensees that "an auto auction as defined in § 55-17-102(2)(A) to maintain or use an escrow account when the auction does not accept and deposit funds of others" is not required to maintain or use an escrow account. Therefore, the Commission declined to adopt the amendatory language to proposed Rule 0160-01-.26 as suggested by this commenter.

Comment 10

Rule 0160-01-.28 (Online Auctions)

There was a comment thanking the Commission for proposing and approving proposed Rule 0160-01-.28 regarding online auctions.

Agency Response to Comment 10: The agency thanked the commenter for her comments and asked if she required any further response to her comment. The commenter stated that she required no further response to her comment and simply wished to express her thanks to the Commission for their efforts to regulate online auctions.

Comment 11

Rule 0160-01-.28 (Online Auctions)

There was a comment asserting that proposed Rule 0160-01-.28 would require the commenter, who has been selling titled vehicles to the public online under his auctioneer license and his auctioneer firm license, to obtain a public motor vehicle auctioneer's license (which the commenter does not believe he needs under the current law and rules). The commenter stated that his business is more profitable when he doesn't have to have a fixed closing time for his online auto auctions. Accordingly, while the commenter said he would obtain any additional licenses to continue operating his business as necessary, he said he simply wished to bring his situation to the Commission's attention prior to approval of this proposed rule.

Agency Response to Comment 11: The agency stated that, although it appreciated the commenter's opinion, it believes that proposed Rule 0160-01-.28 accurately reflects the Commission's interpretation of the online auction

exemption as set forth in T.C.A. § 62-19-103(9). Accordingly, the agency voted to move forward with the language for proposed Rule 0160-01-.28 as set forth in Comment 7 (see above).

Regulatory Flexibility Addendum

Pursuant to T.C.A. §§ 4-5-401 through 4-5-404, prior to initiating the rule making process as described in T.C.A. § 4-5-202(a)(3) and T.C.A. § 4-5-202(a), all agencies shall conduct a review of whether a proposed rule or rule affects small businesses.

1. The extent to which the rule may overlap, duplicate, or conflict with other federal, state, and local governmental rules:

There will be no known overlap, duplication, or conflict with other federal, state, or local governmental rules.

2. Clarity, conciseness, and lack of ambiguity in the rule:

The rules are clear, concise, and unambiguous. Further, the rules are not open to different interpretations.

3. The establishment of flexible compliance and reporting requirements for small businesses:

These rules provide uniform and reasonable requirements, both for licensees of the Tennessee Auctioneer Commission, as well as those individuals who wish to be licensed with the Tennessee Auctioneer Commission. These rules assist with ensuring the welfare and safety of the citizens of Tennessee.

4. The establishment of friendly schedules or deadlines for compliance and reporting requirements for small businesses:

These rules do not establish additional schedules or deadlines compliance or reporting requirements for licensees. These rules allow military personnel who are engaged in small business flexible reporting requirements with regard to their licenses.

5. The consolidation or simplification of compliance or reporting requirements for small businesses:

These rules, some of which amend current rules and some of which are new rules, are intended to provide clarification and do not complicate compliance or reporting requirements for small businesses.

6. The establishment of performance standards for small businesses as opposed to design or operational standards required in the proposed rule:

The performance standards in these rules aid in protecting the public's health, safety and welfare. These rules do not establish design or operational standards.

7. The unnecessary creation of entry barriers or other effects that stifle entrepreneurial activity, curb innovation, or increase costs:

These rules do not result in the unnecessary creation of entry barriers or other effects that will stifle entrepreneurial activity, curb innovation, or increase costs.

Impact on Local Governments

Pursuant to T.C.A. §§ 4-5-220 and 4-5-228 "any rule proposed to be promulgated shall state in a simple declarative sentence, without additional comments on the merits of the policy of the rules or regulation, whether the rule or regulation may have a projected impact on local governments." (See Public Chapter Number 1070 (<http://state.tn.us/sos/acts/106/pub/pc1070.pdf>) of the 2010 Session of the General Assembly)

The proposed rule changes are not projected to have any impact on local governments.

Additional Information Required by Joint Government Operations Committee

All agencies, upon filing a rule, must also submit the following pursuant to T.C.A. § 4-5-226(i)(1).

- (A) A brief summary of the rule and a description of all relevant changes in previous regulations effectuated by such rule;

Amendment to Rule 0160-01-.01 Duties of an Auctioneer: This amendment will number the existing paragraph within the rule as paragraph (1) and add a new paragraph (2) which will state that a licensed auctioneer shall not accept offers for hire to call bids at any auction held by an auction house, auction barn, or auction gallery that is not the holder of valid auction gallery license.

Amendment to Rule 0160-01-.05 Publication of Name: This amendment will change the reference to "sponsoring auctioneer" and "auctioneer" within the existing rule to instead reference the "principal auctioneer."

Amendment to Rule 0160-01-.11 Civil Penalties: This amendment will add a civil penalty range of 0-\$1,000 to violations of T.C.A. § 62-19-125(a) and (b) as well as any Commission rule or order. The amendment also adds a provision stating that each day of a continued violation may constitute a separate violation.

Amendment to Rule 0160-01-.14 Fees: This amendment will delete a paragraph which provided for a penalty fee of one hundred dollars (\$100.00) for any notification of change of information which is made to the Commission more than sixty (60) days after the effective date of the new information.

Amendment to Rule 0160-01-.16 Non-Auctioneer Firm License Application: This amendment will specify that any non-auctioneer owned firm must register one (1) licensed auctioneer who will serve as the firm's principal auctioneer and must attend and accept responsibility for all auctions. The amendment further states that the Commission must be notified within ten (10) days of the absence of the non-auctioneer owned firm's principal auctioneer, and a new principal auctioneer must be in place (and the Commission notified) on or before thirty (30) days have passed. The amendment specifies that no auctions shall be conducted by the non-auctioneer owned firm until a new principal auctioneer is placed.

Amendment to Rule 0160-01-.24 Notification of Change of Information: This amendment adds a new paragraph (2) which states that the Commission must be notified within ten (10) days of the absence of a firm's principal auctioneer, and a new principal auctioneer must be in place (and the Commission notified) on or before thirty (30) days have passed.

New Rule 0160-01-.26 Escrow Account Requirement: This proposed new rule states that all auction firms and galleries must have an escrow or trustee account for all funds which are held which belong to others as a result of an auction sale.

New Rule 0160-01-.27 Livestock Auction Sales: This proposed new rule states that the licensing exemption found within T.C.A. § 62-19-103 does not apply to any livestock auction which is not registered and regulated by the packers and stockyards administration. Further, this proposed new rule states that if a registered livestock auction facility also sells additional items at a regulated auction and the proceeds are deposited into a packers and stockyards account, then no firm or gallery license is necessary, but the person conducting the auction must hold an auctioneer's license. Finally, this proposed new rule states that if a regulated livestock auction conducts merchandise, equipment, or personal property auctions which are not held during a livestock auction, then the facility must have a firm or gallery license, and the person conducting said auction must have an auctioneer's license.

New Rule 0160-01-.28 Online Auctions: This proposed new rule states that if the time for a fixed time online only auction is extended beyond the stated ending time, then the auction and the person conducting the auction are no longer included in the licensing exemption found at T.C.A. § 62-19-103.

New Rule 0160-01-.29 Military Applicants: This proposed new rule provides for the expedited processing of applications for certain military personnel and their spouses, the recognition of education earned through military service, and the allowance of license renewal for six (6) months from the release from active duty without penalty when certain specified circumstances are met.

- (B) A citation to and brief description of any federal law or regulation or any state law or regulation mandating promulgation of such rule or establishing guidelines relevant thereto;

T.C.A. § 4-3-1304 requires each program attached to the division of regulatory boards (which includes the Tennessee Auctioneer Commission) to promulgate rules and regulations to effectuate the purposes of this act. The primary purpose of T.C.A. § 4-3-1304 is for each program attached to the division of regulatory boards to promulgate rules establishing an expedited license application and/or renewal process for certain members of the military. The proposed amendment to Rule 0160-01-.29 is promulgated in response to T.C.A. § 4-3-1304.

- (C) Identification of persons, organizations, corporations or governmental entities most directly affected by this rule, and whether those persons, organizations, corporations or governmental entities urge adoption or rejection of this rule;

The proposed amendments to the Tennessee Auctioneer Commission rules will affect auctioneers and auction firms licensed by the Commission. Although there were several public comments received as part of this rulemaking hearing process, it does not appear that substantial opposition to these proposed rule changes exists among the individuals and businesses most directly affected by the proposed rule changes.

- (D) Identification of any opinions of the attorney general and reporter or any judicial ruling that directly relates to the rule;

Although it does not appear to be directly on point, Attorney General Opinion 06-053 (issued March 27, 2006) does contain some language regarding potential interpretation of the Auctioneer statute regarding online auctions.

- (E) An estimate of the probable increase or decrease in state and local government revenues and expenditures, if any, resulting from the promulgation of this rule, and assumptions and reasoning upon which the estimate is based. An agency shall not state that the fiscal impact is minimal if the fiscal impact is more than two percent (2%) of the agency's annual budget or five hundred thousand dollars (\$500,000), whichever is less;

The anticipated fiscal impact to state and local government revenues and expenditures of these proposed rule changes is anticipated to be minimal.

- (F) Identification of the appropriate agency representative or representatives, possessing substantial knowledge and understanding of the rule;

Sarah M. Mathews, Assistant General Counsel for the Tennessee Auctioneer Commission

- (G) Identification of the appropriate agency representative or representatives who will explain the rule at a scheduled meeting of the committees;

Sarah M. Mathews, Assistant General Counsel for the Tennessee Auctioneer Commission

- (H) Office address, telephone number, and email address of the agency representative or representatives who will explain the rule at a scheduled meeting of the committees; and

500 James Robertson Parkway, Nashville, TN 37243; Phone: (615) 532-6303; E-Mail: Sarah.Mathews@tn.gov

- (I) Any additional information relevant to the rule proposed for continuation that the committee requests.

N/A

**Department of State
Division of Publications**

312 Rosa L. Parks Avenue, 8th Floor Snodgrass/TN Tower
Nashville, TN 37243
Phone: 615-741-2650
Email: publications.information@tn.gov

For Department of State Use Only

Sequence Number: 09-04-16
Rule ID(s): 6298
File Date: 9/6/16
Effective Date: 12/5/16

Rulemaking Hearing Rule(s) Filing Form

Rulemaking Hearing Rules are rules filed after and as a result of a rulemaking hearing (Tenn. Code Ann. § 4-5-205).

Pursuant to Tenn. Code Ann. § 4-5-229, any new fee or fee increase promulgated by state agency rule shall take effect on July 1, following the expiration of the ninety (90) day period as provided in § 4-5-207. This section shall not apply to rules that implement new fees or fee increases that are promulgated as emergency rules pursuant to § 4-5-208(a) and to subsequent rules that make permanent such emergency rules, as amended during the rulemaking process. In addition, this section shall not apply to state agencies that did not, during the preceding two (2) fiscal years, collect fees in an amount sufficient to pay the cost of operating the board, commission or entity in accordance with § 4-29-121(b).

Agency/Board/Commission:	Tennessee Auctioneer Commission
Division:	Regulatory Boards
Contact Person:	Sarah M. Mathews
Address:	500 James Robertson Parkway, Nashville, Tennessee 37243
Phone:	(615) 741-3072
Email:	Sarah.Mathews@tn.gov
Agency/Board/Commission:	Tennessee Auctioneer Commission

Revision Type (check all that apply):

- Amendment
 New
 Repeal

Rule(s) Revised (ALL chapters and rules contained in filing must be listed here. If needed, copy and paste additional tables to accommodate multiple chapters. Please enter only ONE Rule Number/Rule Title per row)

Chapter Number	Chapter Title
0160-01	Regulations of Auctioneers
Rule Number	Rule Title
0160-01-01	Duties of Auctioneer
0160-01-05	Publication of Name
0160-01-11	Civil Penalties
0160-01-14	Fees
0160-01-16	Non-Auctioneer Firm License Application
0160-01-24	Notification of Change of Information
0160-01-26	Escrow Account Requirement
0160-01-27	Livestock Auction Sales
0160-01-28	Online Auctions
0160-01-29	Military Applicants

Chapter 0160-01
Regulations of Auctioneers

Amendments

Rule 0160-01-.01 Duties of Auctioneer is amended by amending and numbering the existing paragraph as paragraph (1) and adding a new paragraph (2), which shall read as follows:

- (1) The Auctioneer shall be responsible for the advertising and management of the sale and account for all proceeds therefrom and shall, over his or her signature, issue a closing statement to the seller or sellers.
- (2) No licensed auctioneer shall accept offers for hire to call bids at any auction held by an auction house, auction barn, or auction gallery that is not either:
 - (a) owned and operated by a licensed auctioneer holding a valid firm license; or
 - (b) licensed as a gallery pursuant to the provisions of T.C.A. § 62-19-125.

Authority: T.C.A. §§ 62-19-106 and 62-19-125.

Rule 0160-01-.05 Publication of Name is amended by deleting the phrase "name of its sponsoring auctioneer, and the auctioneer" in paragraph (2) and replacing it with the phrase "name of its principal auctioneer, and the principal auctioneer" so that, as amended, the paragraph shall read:

- (2) All advertising of an auction sale by an auction firm not owned by a licensed auctioneer shall include the name of its ~~sponsoring~~ principal auctioneer, and the principal auctioneer shall attend all auction sales.

Authority: T.C.A. §§ 62-19-106 and 62-19-111.

Rule 0160-01-.11 Civil Penalties is amended by deleting the text of the rule in its entirety and substituting, instead, the following language so that, as amended, the rule shall read:

- (1) With respect to any person required to be licensed by the Commission, the Commission may assess a civil penalty against such person in accordance with the following schedule:

Violation	Penalty
T.C.A. § 62-19-102(a)(1)	0 - \$1,000
T.C.A. § 62-19-102(a)(2)	0 - \$1,000
T.C.A. § 62-19-102(a)(3)	0 - \$1,000
T.C.A. § 62-19-102(b)	0 - \$1,000
T.C.A. § 62-19-112(b)(1)	0 - \$1,000
T.C.A. § 62-19-112(b)(2)	0 - \$1,000
T.C.A. § 62-19-112(b)(3)	0 - \$1,000
T.C.A. § 62-19-112(b)(4)	0 - \$1,000
T.C.A. § 62-19-112(b)(5)	0 - \$1,000
T.C.A. § 62-19-112(b)(6)	0 - \$1,000
T.C.A. § 62-19-112(b)(7)	0 - \$1,000
T.C.A. § 62-19-112(b)(8)	0 - \$1,000
T.C.A. § 62-19-112(b)(9)	0 - \$1,000
T.C.A. § 62-19-112(b)(10)	0 - \$1,000
T.C.A. § 62-19-112(b)(11)	0 - \$1,000
T.C.A. § 62-19-112(b)(12)	0 - \$1,000

T.C.A. § 62-19-112(b)(13)	0 - \$1,000
T.C.A. § 62-19-125(a)	0 - \$1,000
<u>T.C.A. § 62-19-125(b)</u>	<u>0 - \$1,000</u>
T.C.A. § 62-19-128(b)	0 - \$1,000
T.C.A. § 62-19-128(c)	0 - \$1,000
T.C.A. § 62-19-128(d)	0 - \$1,000
T.C.A. § 62-19-128(e)	0 - \$1,000
T.C.A. § 62-19-128(f)	0 - \$1,000
<u>Any Commission Rule or Order</u>	<u>0 - \$1,000</u>

(2) Each day of a continued violation under paragraph (1) constitutes a separate violation.

(3) (2) The Commission's administrative director and investigator, acting on behalf of the Commission, may issue citations to unlicensed individuals or entities in accordance with T.C.A. § 62-19-126 and the following schedule:

Violation	Penalty
T.C.A. § 62-19-102 (a) (1)	\$50-\$2,500
T.C.A. § 62-19-102 (a) (2)	\$50-\$2,500
T.C.A. § 62-19-102 (b)	\$50-\$2,500
T.C.A. § 62-19-125 (a)	\$50-\$2,500

(4) (3) In determining the amount of any penalty to be assessed pursuant to this rule, the Commission may consider such factors as the following:

- (a) Whether the amount imposed will be a substantial economic deterrent to the violator;
- (b) The circumstances leading to the violation;
- (c) The severity of the violation and the risk of harm to the public;
- (d) The economic benefits gained by the violator as a result of non-compliance; and
- (e) The interest of the public.

Authority: T.C.A. §§ 56-1-308, 62-19-106, 62-19-116 and 62-19-126.

Rule 0160-01-.14 Fees is amended by deleting paragraph (6) in its entirety:

(6) ~~Any notification of change of information pursuant to rule 0160-01-.24 made to the Commission more than sixty (60) days after the effective date of the new information shall result in a penalty of one hundred dollars (\$100.00).~~

Authority: T.C.A. §§ 62-19-106(b).

Rule 0160-01-.16 Non-Auctioneer Firm License Application is amended by deleting the name and text of the rule in its entirety and substituting, instead, the following language so that, as amended, the name and rule shall read:

0160-01-.16 Non-Auctioneer Owned Firms LICENSE APPLICATION.

(1) A non-auctioneer owned firm is an auction firm which is not owned in any part by a person who holds a Tennessee auctioneer's license.

- ~~(2) (1) Upon application to the Commission for an auction firm license or renewal thereof by any business entity, including a limited liability company, corporation or partnership not engaged in the auction business as the entity's principal business, the applicant shall designate a natural person who is an employee, owner, shareholder, partner, or member of the entity, who meets the applicable requirements of T.C.A. § 62-19-111 and who will be responsible for such license. Every application by a business entity, including a limited liability company, corporation or partnership not principally engaged in the auction business, for an auction firm license or license renewal shall designate as the applicant a natural person who is an employee, owner, shareholder, partner, or member of the entity and meets the applicable requirements of T.C.A. § 62-19-111. The designated applicant shall be the individual responsible for the firm's license.~~
- ~~(3) (2) An Auction firm as described in paragraph (1), must have at least one (1) licensed auctioneer to conduct and call auctions for the firm at each location involved in auction sales. A non-auctioneer owned firm must also designate in its auction firm license application one (1) licensed auctioneer who shall serve as the firm's principal auctioneer. The principal auctioneer shall attend and, along with the firm, shall accept responsibility for all auctions conducted by the firm.~~
- ~~(4) Any non-auctioneer owned firm must notify the Commission within ten (10) days of the death, resignation, termination or other extended absence of the firm's principal auctioneer. The firm shall have no longer than thirty (30) days from the death, resignation, termination or other extended absence within which to replace the principal auctioneer and must immediately notify the Commission in writing of the auctioneer's replacement. The firm shall not conduct any auctions until the Commission has received its designation of a new principal auctioneer.~~

Authority: T.C.A. §§ 62-19-102, 62-19-106, and 62-19-111.

Rule 0160-01-.24 Notification of Change of Information is amended by adding the following language as a new paragraph (2):

- (2) Any firm must notify the Commission within ten (10) days of the death, resignation, termination or other extended absence of the firm's principal auctioneer. The firm shall have no longer than thirty (30) days from the death, resignation, termination or other extended absence within which to replace the principal auctioneer and must immediately notify the Commission in writing of the auctioneer's replacement.

Authority: T.C.A. §§ 62-19-106 and 62-19-111.

Chapter 0160-01
Regulations of Auctioneers

New Rules

0160-01-.26 Escrow Account Requirement.

All licensed auction firms and galleries shall maintain an escrow or trustee account for all funds that belong to others coming into the possession of the firm or gallery as a result of an auction sale.

Authority: T.C.A. §§ 62-19-106 and 62-19-112(b)(4).

0160-01-.27 Livestock Auction Sales.

- (1) Pursuant to T.C.A. § 62-19-103(8), the provisions of title 62, chapter 19 do not apply to any livestock auction sale regulated by the United States Department of Agriculture Packers & Stockyards Administration, if the sale uses:

- (a) The shipper's proceeds account required by federal regulations; and
- (b) A Tennessee licensed auctioneer.
- (2) Any operator of a livestock auction sale that is not registered with and regulated by the Packers & Stockyards Administration shall not qualify for the firm or gallery license exemption under T.C.A. § 62-19-103(8) and must be appropriately licensed.
- (3) Any person acting as an auction firm or gallery outside of a livestock auction regulated by the Packers & Stockyards Administration shall hold a Tennessee auction firm or gallery license and is subject to all statutes and rules of the Tennessee Auctioneer Commission notwithstanding such person's registration with the Packers & Stockyards Administration.
- (4) Nothing in this rule shall be construed as exempting any person acting as or advertising or representing to be an auctioneer or apprentice auctioneer from the licensure requirements of T.C.A. § 62-19-102.

Authority: T.C.A. §§ 62-19-102, 62-19-103, and 62-19-106.

0160-01-28 Online Auctions.

Pursuant to the exemption in T.C.A. § 62-19-103(9), "timed listings" do not include listings that are extended or those in which a bidder has the opportunity to increase a bid beyond the original deadline.

Authority: T.C.A. §§ 62-19-102, 62-19-103, and 62-19-106.

0160-01-29 Military Applicants

- (1) An applicant for licensure meeting the requirements of T.C.A. § 4-3-1304(d)(1) may:
 - (a) Be issued a license upon application and payment of all fees required for the issuance of a regular license of the same type if, in the opinion of the Commission, the requirements for licensure of such other state are substantially equivalent to that required in Tennessee; or
 - (b) Be issued a temporary permit as described herein if the Commission determines that the applicant's license does not meet the requirements for substantial equivalency, but that the applicant could perform additional acts, including – but not limited to – education, training, or experience, in order to meet the requirements for the license to be substantially equivalent. In that case, the Commission may issue a temporary permit upon application and payment of all fees required for issuance of a regular license of the same type which shall allow such person to perform services as if fully licensed for a set period of time that is determined to be sufficient by the Commission for the applicant to complete such requirements.
 - 1. After completing those additional requirements and providing the Commission with sufficient proof thereof as may be required, a full license shall be issued to the applicant with an issuance date of the date of the original issuance of the temporary permit and an expiration date as if the full license had been issued at that time.
 - 2. A temporary permit shall be issued for a period of less than the length of a renewal cycle for a full license.

3. A temporary permit shall expire upon the date set by the Commission and shall not be subject to renewal except through the timely completion of the requirements for substantial equivalency as required by the Commission or by an extension of time granted for good cause by the Commission.
 4. Should an extension to a temporary permit cause the permit to be in effect longer than the renewal cycle of a full license, then the holder of the temporary permit shall file a renewal application with such documentation and fees, including completion of continuing education, as are required by the Commission for all other renewals of a full license of the same type.
- (2) Military education, training, or experience completed by a person described at T.C.A. § 4-3-1304(d)(1)(B)(ii)(a)-(c) shall be accepted toward the qualifications, in whole or in part, to receive any license issued by the Commission under the Division of Regulatory Boards if such military education, training or experience is determined by the Commission to be substantially equivalent to the education, training, or experience required for the issuance of such license.
- (3) Renewal:
- (a) Any licensee who is a member of the national guard or a reserve component of the armed forces of the United States called to active duty whose license expires during the period of activation shall be eligible to be renewed upon the licensee being released from active duty without:
 1. Payment of late fees or other penalties;
 2. Obtaining continuing education credits when:
 - (i) Circumstances associated with the person's military duty prevented the obtaining of continuing education credits and a waiver request has been submitted to the Commission; or
 - (ii) The person performs the licensed occupation as part of such person's military duties and provides documentation sufficient to demonstrate such to the Commission.
 3. Performing any other similar act typically required for the renewal of a license.
 - (b) The license shall be eligible for renewal pursuant to this paragraph for six (6) months from the person's release from active duty.
 - (c) Any person renewing under this paragraph shall provide the Commission such supporting documentation evidencing activation as may be required by the Commission prior to renewal of any license pursuant to this paragraph.

Authority: T.C.A. §§ 4-3-1304 and 62-19-106.

* If a roll-call vote was necessary, the vote by the Agency on these rulemaking hearing rules was as follows:

Board Member	Aye	No	Abstain	Absent	Signature (if required)
Howard Phillips	X				
Jeff Morris	X				
Bobby Colson	X				
Brian Colyer	X				
Adam Lewis	X				

I certify that this is an accurate and complete copy of rulemaking hearing rules, lawfully promulgated and adopted by the Tennessee Auctioneer Commission on 10/06/2014, and is in compliance with the provisions of T.C.A. § 4-5-222.

I further certify the following:

Notice of Rulemaking Hearing filed with the Department of State on: 06/24/14

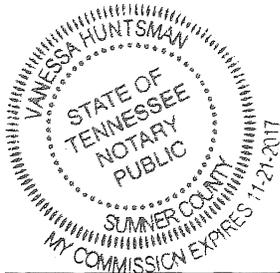
Rulemaking Hearing(s) Conducted on: (add more dates). 10/06/14

Date: August 11, 2016

Signature: Sarah M. Mathews

Name of Officer: SARAH M. MATHEWS

Title of Officer: ASSISTANT GENERAL COUNSEL



Subscribed and sworn to before me on: August 11, 2016

Notary Public Signature: Vanessa Huntsman

My commission expires on: Nov. 21, 2017

All rulemaking hearing rules provided for herein have been examined by the Attorney General and Reporter of the State of Tennessee and are approved as to legality pursuant to the provisions of the Administrative Procedures Act, Tennessee Code Annotated, Title 4, Chapter 5.

Herbert H. Slatery III
Herbert H. Slatery III
Attorney General and Reporter

8/29/2016
Date

Department of State Use Only

Filed with the Department of State on: 9/6/16

Effective on: 12/5/16

Tre Hargett
Tre Hargett
Secretary of State

RECEIVED
2016 SEP -6 1:37
SECRETARY OF STATE
PUBLICATIONS

G.O.C. STAFF RULE ABSTRACT

AGENCY: Department of Revenue

SUBJECT: State Sales and Use Tax Rules

STATUTORY AUTHORITY: Tenn. Code Ann., Section 67-6-402

EFFECTIVE DATES: January 1, 2017 through June 30, 2017

FISCAL IMPACT: Estimated increase in state and local revenue of at least \$200 million per year when full compliance is reached.

STAFF RULE ABSTRACT: The rulemaking hearing rule sets out sales and use tax registration and collection requirements for out-of-state dealers who regularly and systematically solicit business in Tennessee and who made more than \$500,000 in sales in Tennessee during the previous 12-month period. These dealers must register for sales and use tax by March 1, 2017, and begin to collect and remit tax by July 1, 2017, or a later date set by the Department. An out-of-state dealer who meets the \$500,000 threshold after March 1, 2017, must register and begin to collect tax by the first day of the third calendar month following the month in which the dealer met the threshold.

Public Hearing Comments

One copy of a document containing responses to comments made at the public hearing must accompany the filing pursuant to T.C.A. § 4-5-222. Agencies shall include only their responses to public hearing comments, which can be summarized. No letters of inquiry from parties questioning the rule will be accepted. When no comments are received at the public hearing, the agency need only draft a memorandum stating such and include it with the Rulemaking Hearing Rule filing. Minutes of the meeting will not be accepted. Transcripts are not acceptable.

Summary of the Department of Revenue's Responses to Public Comments

The State of Tennessee is heavily dependent on the sales tax for revenues. Internet sales continue to expand each year, resulting in ever increasing losses of sales tax revenue to Tennessee. Additionally, both Tennessee and out-of-state businesses that collect the sales tax are put at a competitive disadvantage with respect to businesses that do not. Out-of-state businesses that do not collect the sales tax have a nearly 10% price advantage over businesses that collect the tax, in addition to the benefit that many derive from in-state stores effectively functioning as show rooms for the products that out-of-state businesses sell.

This rule protects the State of Tennessee's tax base and fiscal health as remote sales continue to increase each year. This rule also ensures that the State's economy remains strong and that all businesses selling to Tennessee consumers compete on a level playing field.

The Department of Revenue received several comments in support of the rule filing and several comments opposing the rule filing. It also received comments that did not express support or opposition, but instead made specific inquiries or suggestions about the rule filing.

Almost all participants in the Rulemaking Hearing process provided comments on similar topics, which the Department has grouped into the following categories: 1) The question of the rule's constitutionality in light of the U.S. Supreme Court's decision in *Quill Corp. v. North Dakota*, 504 U.S. 298 (1992); 2) The balancing of in-state and out-of-state business interests; 3) The impact of the rule on Tennessee businesses and on small businesses; 4) The cost of compliance with the rule; 5) Whether the rule enacts a new tax; 6) The mechanics of the rule; 7) Potential litigation challenging the rule; and 8) The economic effect of the rule.

1. Constitutionality of the rule

A number of commenters addressed the constitutionality of the rule under the U.S. Supreme Court's decision in *Quill Corp. v. North Dakota*, 504 U.S. 298 (1992). In *Quill*, the Court held that North Dakota had violated the dormant Commerce Clause by requiring an out-of-state catalogue business with no physical presence in North Dakota to collect a use tax from its North Dakota customers, because that business lacked a "substantial nexus" with North Dakota.

Some commenters took the position that the rule is unconstitutional under *Quill*. These commenters asserted that the considerations motivating the Court's decision in *Quill* are still relevant; in particular, that the cost of complying with sales tax collection and remittance obligations in other jurisdictions remains burdensome and that Congressional action is still the preferred solution. Commenters thought it unlikely that the U.S. Supreme Court will overrule *Quill*. One commenter asked whether the rule impermissibly exceeds the scope of the Retailers' Sales Tax Act, given that the sales tax laws provide for the collection of sales tax within the bounds of the Constitution.

Other commenters asserted that the Court's reasoning in *Quill* is no longer applicable because, among other things, the cost of complying with collection and remittance obligations in other jurisdictions continues to decline, and, despite twenty-four years of effort, Congress has been unable to pass legislation authorizing states to require out-of-state sellers to collect and remit sales and use taxes. Commenters noted that, in a concurring opinion in *Direct Marketing Association v. Brohl*, 135 S. Ct. 1124 (2015), Justice Kennedy expressed doubt about the continued validity of the bright-line rule adopted in *Quill* given the significant technological and economic changes that have occurred in the decades following that decision.

Response:

The Department believes the proposed rule is permissible under the Commerce Clause. In *Quill*, the U.S.

Supreme Court held that North Dakota had created an unconstitutional burden on interstate commerce, in violation of the dormant Commerce Clause, by requiring an out-of-state catalogue business with no physical presence in North Dakota to collect a use tax from its North Dakota customers, because that business lacked a “substantial nexus” with North Dakota. In doing so, the Court adhered to its previous decision in *National Bellas Hess v. Department of Revenue*, 386 U.S. 753 (1967), while acknowledging that the physical-presence rule *Bellas Hess* adopted was “artificial” and inconsistent with the Court’s “contemporary Commerce Clause jurisprudence.” *Quill*, 504 U.S. at 311, 315. The Court reasoned that the physical-presence rule would relieve out-of-state vendors of the burden of complying with other jurisdictions’ tax collection duties, *id.* at 315 & n.8, and that Congress had “the ultimate power” to determine “whether, when, and to what extent the States may burden interstate mail-order” companies with that duty. *Id.* at 318.

In the twenty-four years since the U.S. Supreme Court decided *Quill*, there have been a number of significant developments that cast serious doubt on the continued validity of *Quill*’s physical-presence rule. First, as Justice Kennedy recognized in his concurring opinion in *Brohl*, the “Internet has caused far-reaching systemic and structural changes in the economy” in the years since *Quill* was decided, and there is a strong case to be made that “a business may [now] be present in a State in a meaningful way without that presence being physical in the traditional sense of the term.” 135 S. Ct. at 1135 (Kennedy, J., concurring). When *Quill* was decided, “mail-order sales in the United States totaled \$180 billion,” and “the Internet was in its infancy.” *Id.* As of 2008, “e-commerce sales alone totaled \$3.16 trillion per year in the United States.” *Id.* As Internet sales have increased, it has become increasingly evident that the physical-presence rule gives out-of-state businesses an unfair competitive advantage over in-state retailers and deprives States—particularly Tennessee, given its heavy reliance on sales tax—of a significant source of revenue.

Second, the cost and burden of complying with collection and remittance obligations in other jurisdictions has decreased due to an increasing array of affordable software options, among other developments. Tennessee, in particular, has greatly simplified sales tax collection by offering retailers without a traditional physical location in the state the option of collecting sales tax at a single uniform rate and filing a single return.

Third, although the Administration has encouraged Congress for several years to enact fair and reasonable legislation that requires sales tax collection by out-of-state sellers, and would welcome such a solution, Congress has not enacted any of the various proposals put forward in the twenty-four years since *Quill* was decided.

Given these developments, the Department believes there is a strong possibility that the U.S. Supreme Court will distinguish or reconsider *Quill*, as evidenced by Justice Kennedy’s express invitation for the “legal system [to] find an appropriate case for [the U.S. Supreme] Court to reexamine *Quill* and *Bellas Hess*.” *Brohl*, 135 S. Ct. at 1135 (Kennedy, J., concurring). The Department believes that the out-of-state businesses to whom the proposed rule would apply plainly have a “substantial nexus” with the State of Tennessee and therefore may be required to collect and remit sales tax from their Tennessee customers. The rule applies only to out-of-state businesses that have more than \$500,000 of sales in Tennessee; a business that conducts such a substantial amount of sales activity in the State clearly benefits from the State’s market and customers and will not be unduly burdened by having to collect and remit sales tax to the State.

A summary of the Department’s response to related comments on compliance burdens is provided below.

2. Balancing in-state business interests with out-of-state business interests

Commenters stated that there is an unfair competitive advantage that out-of-state retailers enjoy by being perceived as making sales to Tennessee customers “tax free.” The commenters pointed out that the State is predominantly dependent on sales tax revenue and that this rule is necessary to protect the tax base.

Commenters also asserted that Tennessee retailers bear higher compliance costs as a percentage of their sales tax collected because in-state retailers handle transactions made via cash, check, and credit card, whereas out-of-state online retailers generally process transactions made only via credit card or via a centralized payment service.

Some in-state businesses commented that they would be harmed by the rule because it would lead to other states enacting similar rules that would require them to collect sales tax in those states.

Response:

The Department believes that this rule will put all retailers on a level playing field in collecting and remitting the sales and use tax.

The issue is ultimately not one of in-state business vs. out-of-state business. Numerous businesses with no physical presence in Tennessee have chosen to register with the Department and collect Tennessee sales tax. These businesses are also placed at a price disadvantage when compared to retailers who do not collect the tax. This rule levels the playing field for these out-of-state businesses as well.

With respect to the comments that in-state businesses would be harmed by the rule because it would lead to their having to comply with other states' laws, the Department has addressed the concern over other states' actions below. The Department respectfully suggests that it is not good public policy for a state to decline to enforce its own sales tax laws because some members of the public do not wish to comply with possible future requirements imposed on them by other states seeking to enforce their own laws.

3. Impact specifically on Tennessee businesses and on small businesses in general

Commenters stated that the rule is burdensome on Tennessee businesses and on small businesses in general because it will force them to incur significant costs to comply with varying laws in over 10,000 taxing jurisdictions.

Commenters stated that promulgation of the rule encourages other states to enact similar laws that might require Tennessee businesses to collect sales tax on their sales into those states, which would be burdensome. Additionally, commenters stated other states might enact similar laws with lower thresholds for economic nexus, which might impose a compliance burden on Tennessee small businesses.

Commenters stated that the rule will expose Tennessee sellers to audit by other state taxing agencies, and force Tennessee businesses to defend themselves in other states' courts against other states' audits.

Response:

This rule does not impact Tennessee businesses. Likewise, this rule does not impact small businesses, regardless of location.

First, this rule by its express terms applies only to out-of-state retailers selling into Tennessee. Retailers with a physical presence in Tennessee are already required to collect and remit the sales tax, and are thus not subject to any new requirements as a result of this rule. Importantly, this rule does not require Tennessee businesses to comply with the laws of even a single other jurisdiction – let alone the laws of over 10,000 other jurisdictions. Tennessee businesses will not incur a single dollar of cost to comply with this rule. This rule simply requires remote sellers to comply with the same laws that Tennessee retailers already comply with.

Second, this rule does not apply to small businesses with no physical presence in Tennessee. To be subject to the rule's registration and tax collection requirements, a seller must make more than \$500,000 in sales into Tennessee in a twelve-month period. Given that it is very unlikely that a seller without a physical presence in Tennessee will make sales solely into Tennessee, out-of-state businesses who meet the \$500,000 Tennessee threshold are likely to have total sales that far exceed that amount.

Third, this rule will not expose Tennessee sellers to audit by other states' taxing agencies. The rule contains no provision allowing another state to audit Tennessee sellers. Similarly, the rule contains no provision requiring Tennessee sellers to comply with the sales tax laws of other states. Because Tennessee sellers are not exposed to other states' audits by this rule, it follows that Tennessee sellers will not be forced to defend themselves in other states' courts as a result of audits.

Fourth, the Department is unaware of any other states that are actively planning to follow suit if Tennessee promulgates the rule. If other states are considering taking similar action, it is extremely doubtful that they would abandon their efforts in the absence of a similar rule in Tennessee. Other states will proceed with any intended plans regardless of whether Tennessee promulgates a rule or not.

Finally, it is simply not good public policy to decline to enforce Tennessee's tax laws based on conjecture that other states might later choose to enforce their own tax laws, and might choose to enforce them in a manner that

might be burdensome to Tennessee businesses.

4. Cost of Compliance

Commenters stated that affordable tax management software options are readily available from multiple vendors. They point out that online retailers have dedicated “shopping carts” for ease of application in calculating tax before the purchase. They believe that many retailers already have some form of software to address this issue in states in which they already have physical presence.

One commenter provided evidence stating that 24 studies were completed between 1956 and 1983. Those studies found that the median cost of collection during that period was 4.4% of sales tax collected. A 1993 survey found the average compliance cost in all states had declined to 3.18% of sales tax collected. A 1990 PriceWaterhouseCoopers study found a national average cost of compliance to be 3.48% of tax collected. This is a decrease of almost 25% from the prior studies and largely due to technological changes and advances in web-based solutions. The Joint Cost of Collection Study found that from 2004-2005, average gross compliance costs had decreased again to 3.09% of sales tax collected.

One commenter made reference to a study entitled Retail Sales Tax Compliance Costs: A National Estimate, Volume One: Main Report, prepared for Joint Cost of Collection Study, conducted by PricewaterhouseCoopers, April 7, 2006. At page 18, the study concludes that the cost of compliance for remote dealers operating under multiple states’ laws is not greater than the cost of compliance of dealers operating in only one state. This study found that the weighted average costs for retailers collecting tax in only one state is 6.17%, compared with 1.94% for retailers filing in more than ten states.

One commenter stated that the cost of compliance would cost small and medium sized businesses “hundreds of thousands of dollars.” Commenters stated that small and medium sized businesses will spend \$80,000 to \$290,000 in setup and integration costs, and \$60,000 to \$260,000 each year on maintenance costs.

One commenter stated that requiring out-of-state sellers to collect the sales tax imposes a disproportionate collection burden on out-of-state sellers.

Response:

Generally speaking, the Department believes that the evidence presented in the studies cited above indicates that the overall cost of complying with sales and use tax collection and remittance is not burdensome and continues to decrease because of technological advances, software availability, and sales tax simplification. The Department notes that thousands of Tennessee businesses already comply with state sales tax laws, and the Department has not received any information indicating that their cost of complying with Tennessee’s laws is prohibitive.

Importantly, this rule does not require any seller – in Tennessee or outside Tennessee – to comply with over 10,000 taxing jurisdictions’ laws. It requires only that sellers comply with Tennessee law. For remote sellers, Tennessee effectively has one single taxing jurisdiction with a single return. Under TENN. CODE ANN. § 67-6-702(f), remote sellers currently can opt to collect a single local tax rate of 2.25% in addition to the 7% state tax rate on all sales made in to the state in lieu of the local option rate applicable to the location of the purchaser. Remote sellers, whether they opt to use the single rate or not, will file a single sales tax return for all sales into Tennessee.

The Department respectfully does not find it credible that remote sellers will incur costs of \$60,000 to \$260,000 each year to comply with Tennessee’s single jurisdiction approach. Likewise, the Department does not believe that remote sellers will incur compliance costs that are higher than the costs borne by in-state sellers, especially given that remote sellers (unlike in-state sellers) have the option of electing to collect the sales tax at a single rate and to remit it to a single jurisdiction.

5. Assertion that the rule creates a new tax

Commenters stated that this rule would be seen as, or is in fact, a new tax. Some of these commenters cited a recent poll of Utah residents as evidence of this assertion. One commenter noted that Tennessee’s non-collection of the sales tax from remote sellers makes purchasers think that the sale is tax-free.

Commenters asserted that promulgation of the rule constitutes taxation without representation, because out-of-state sellers have no political power in the State of Tennessee.

Commenters also stated that the rule does not create a new tax, because the sales and use tax is already due on the sales covered by the rule.

Response:

The rule does not create a new tax. Since 1947, the sales and use tax has been due on all retail sales of tangible personal property or taxable items in Tennessee, unless exempt. This rule does not change current law. Instead, the rule simply ensures that all out-of-state retailers who make sales in Tennessee, above the \$500,000 threshold, properly collect and remit the tax due under current law.

The Department strongly disagrees that promulgation of the rule constitutes taxation without representation. No state is limited to taxing only individual residents who are entitled to vote in the state. Rather, each state may tax individuals and entities that have sufficient nexus with the state, regardless of whether they are entitled to vote there.

The Department respectfully suggests that any perception among the public that enforcement of sales tax laws is the equivalent of imposing a new tax – whether in Tennessee, Utah, or elsewhere – is an issue of public education and not a reason to decline to enforce the law.

6. Mechanics of Rule 129

One group of commenters provided suggestions relating to the mechanics of Rule 129. These suggestions were related to concerns regarding the calendar year period during which the retailer determines that the \$500,000 threshold is met (note that the rule was originally drafted to reference meeting the threshold during a calendar year, instead of during the previous twelve-month period).

These concerns included: whether the rule will pose compliance challenges to sellers who did not anticipate meeting the threshold during the calendar year, but did; whether such sellers will be required to retroactively collect the sales tax on all sales that calendar year; and, whether safeguards were in place against double remittance of sales tax and use tax on the same sale, if there is a retroactive collection requirement. Additionally, the commenter suggested lowering the threshold for registration from \$500,000 to \$100,000 if there is a retroactive collection requirement. One commenter expressed concerns that there may be a duplication of sales tax collected and use tax remitted if the seller had to retroactively collect and remit the sales tax due.

One commenter asked whether the Department would impose any type of penalty on retailers who do not comply with the rule.

One commenter suggested that the Department delay the registration requirement until July 1, 2017, in case the legislature does not approve the rule filing. One commenter asked if the Department would delay implementation of the rule if a request is submitted for an Attorney General Opinion on the issue of whether the rule is constitutional.

Response:

The Department thoroughly considered the comments regarding the calendar year period during which the retailer determines that the \$500,000 threshold is met. The Department appreciates the points commenters made about compliance challenges that might be faced by sellers who did not anticipate meeting the threshold during the calendar year, but in fact did. In response to these comments, the Department revised the period for determining whether a seller has met the \$500,000 threshold from the current calendar year to the preceding twelve-month period. As revised, the rule will require a seller who meets the threshold during that twelve-month period, unless otherwise exempt, to register with the Department and begin collecting the applicable sales tax prospectively. The Department notes that, with respect to any possibility of duplication of sales and use tax remittance, promulgating the rule as revised eliminates the possibility of double remittance due to a seller retroactively remitting the tax due.

The rule does not contain any special penalty provisions for failure to comply with the rule. Rather, retailers who fail to comply with the rule would be subject to any applicable penalties already in existence under current law.

The Department does not believe that it is necessary to delay the rule's registration requirement until July 1, 2017, in case the rule does not receive legislative approval. First, registration will be a very easy, quick process; the Department has developed a simple online registration form that will be available on its website for sellers to use. Second, no remote seller who complies with the rule is required to collect and remit Tennessee sales tax until July 1, 2017. If the rule does not receive legislative approval, remote sellers will have ample notice of that fact before July 1, 2017, and will be able to plan accordingly. Finally, agencies routinely promulgate rules that contain due dates and other requirements that come into effect before final legislative approval. Given that legislative approval is never a certainty with any rule, the Department does not believe that the circumstances surrounding this particular rule warrant a delay in the registration deadline.

The Department does not believe that it would be necessary to delay implementation of the rule if a request were submitted for an Attorney General's opinion on the issue of whether the rule is constitutional. The Department must obtain approval of the rule from the Attorney General before filing the rule with the Tennessee Secretary of State. Therefore, the Attorney General will have already reviewed and approved the rule by the time it is filed.

7. Potential Litigation

Commenters suggested that rather than promulgating a rule, the Department should wait for the outcome of litigation over remote seller requirements pending in other states (litigation cases are currently pending in South Dakota and Alabama).

One commenter asserted that the State has estimated the cost of litigating the constitutionality of the rule to be in the hundreds of millions of dollars. Additionally, the commenter said that if the state loses a legal challenge to the rule, the state will lose its options and the door will be closed to an important source of revenue. Similarly, the commenter asserted that if the state litigates the rule, it will lose hundreds of millions of dollars in needed tax revenues.

In general, commenters concerned about potential litigation suggested that the State should not use its resources to defend a lawsuit challenging this rule.

Response:

Because the sales tax is not currently collected by many out-of-state retailers, the loss of millions of dollars in revenue is already occurring each year. The Department has concluded that requiring collection, litigating, and losing a challenge would not leave the State in any different a position than it is in already. The Department does not believe that a legal challenge to the rule would foreclose any other options the State might have in the future for collection of sales taxes or that an adverse legal decision regarding this rule would prevent the State from pursuing other options in the future. On the contrary, if the rule is not upheld by the courts, the State will be in exactly the same position that it is in right now to pursue alternative means.

The Department strongly disagrees that this rule filing should be delayed because litigation is pending in other states. State tax law is unique and individual to each taxing jurisdiction; Tennessee's proposed rule differs from the rules and statutes that are being challenged in South Dakota and Alabama. The courts may issue decisions in the Alabama and South Dakota cases that might not apply to Tennessee's rule, in which case Tennessee would have lost years in resolving the issue. It is possible that the parties in the South Dakota and Alabama cases will settle out of court or dismiss their lawsuits, again resulting in time lost for Tennessee. The Administration also does not believe that Tennessee should entrust the viability of its primary revenue source to the lawyers and courts of other states, however competent they may be.

The Department notes that no evidence was presented in support of the assertion that defense of a possible litigation case will cost the state hundreds of millions of dollars, either in litigation costs or in lost revenues. The State of Tennessee currently loses millions of dollars in revenue each year due to its inability to require out-of-state sellers to collect the tax on their sales in Tennessee. The Department is not aware of any study that suggests that promulgating a rule that is challenged in court will lead to an increase in lost tax revenue during the challenge. As noted above, an adverse decision would put the state in no worse a position than it is in already.

The Administration also believes that the use of State resources is warranted in this case. Tennessee is heavily dependent on the sales tax for revenues, and lost revenues far exceed the State's costs to defend any possible litigation. The Department is not aware of any estimate by the State that the cost of litigating the rule will be in the

hundreds of millions of dollars, or even anywhere remotely near that amount. Additionally, the State is well equipped to defend a legal challenge to the rule. At any given time, the State is the defendant in numerous lawsuits involving state taxes, many of which are highly complex and involve very high dollar amounts. Given the amounts of revenue at issue, the Administration believes that the use of State resources is more than justified to ensure Tennessee's fiscal health.

8. Economic Effect

Commenters stated that the rule will not actually increase Tennessee's revenues. One commenter specifically said that no additional revenue would be gained because the rule filing simply moves money from Tennessee residents' pockets to state coffers.

Other commenters expressed concern that out-of-state businesses will cease selling products into Tennessee so as to avoid complying with the requirements of this rule. One commenter provided information indicating that imposing an "internet sales tax" will not significantly increase state tax revenues nationwide.

One commenter stated that most catalogue sellers are not competing with "Main Street" retailers because they sell specialty products that cannot be found in brick-and-mortar stores.

One commenter stated that the rule would likely force Tennessee to transfer its tax dollars to private companies running federally mandated software. Another commenter suggested that the State would incur hundreds of thousands of dollars in costs to implement compliance programs.

Other commenters stated that the rule filing strengthens Tennessee's economy by putting Tennessee retailers on a level playing field with out-of-state retailers. These commenters also stated that the rule will reduce the unfair advantage enjoyed by out-of-state retailers who have a price advantage due to not charging sales tax and by effectively using their in-state competitors as show rooms. Commenters stated that the sustainability of Tennessee businesses depends on fair competition and a level playing field.

Response:

The Department believes that the economic effect of the rule will be to strengthen Tennessee's economy by putting retailers who are already collecting the sales tax on a level playing field with those who are not. The State of Tennessee continues to lose an ever-increasing amount of sales tax revenues due to sales in which tax is not collected. The increased compliance with Tennessee's sales tax laws as a result of the rule will ensure that those revenues are no longer lost.

The Department does not find credible the assertion that no additional revenue would be gained because the rule simply moves money from Tennessee residents' pockets to state coffers. Following that logic, the State should act to repeal the sales tax in its entirety. Moreover, the purpose of the rule is not to fill a "coffer," but instead to pay for important services, such as public schools and public safety, that are provided to residents.

Similarly, the Department does not find credible the assertion that out-of-state retailers will cease making sales to Tennessee residents because of the rule. First, only sellers with more than \$500,000 in sales into Tennessee are subject to the rule; it is inconceivable that sellers would en masse abandon over a half million dollars a year in sales to avoid complying with the rule. Second, no evidence was presented indicating that South Dakota and Alabama (the two states that have imposed collection requirements on remote sellers) have experienced any refusal by out-of-state companies to make sales to their residents.

With respect to the comment indicating that increased enforcement by states of their sales tax laws would not significantly increase state tax revenues nationwide, the Department notes that Tennessee is far more dependent on sales tax revenues than the typical state. Most states rely heavily on income taxes for revenue, and therefore experience a smaller overall percentage of lost revenues due to uncollected sales taxes. The Department believes that Tennessee will experience much higher than average increases in revenue due to promulgation of the rule, compared to typical states or on a nationwide scale.

The Department does not agree with the assertion that most catalogue retailers do not compete with "Main Street" businesses. While some catalogue retailers may in fact sell products that are not typically found in brick-and-mortar stores, a large number of catalogue retailers do in fact sell the same types of items. The Department

believes that the large majority of out-of-state sellers offer the same products as in-state sellers, and that there is in fact direct and unbalanced competition between the two groups.

The Department disagrees that the rule would likely force Tennessee to transfer its tax dollars to private companies running federally mandated software. The rule contains no requirement that would require the State of Tennessee to pay private companies for software, federally mandated or otherwise.

The Department also disagrees with the assertion that the State would incur hundreds of thousands of dollars in costs to implement compliance programs. The Department has not asked for any increase in its budget related to the rule. The Department is well equipped to handle any increase in registrations, return filings, and audits that might result from implementation of the rule. Additionally, the Department's recently acquired state-of-the-art integrated tax software system has all of the functionality needed to administer the rule.

The Department believes that the rule strengthens Tennessee's economy by putting Tennessee retailers on a level playing field with out-of-state retailers. The Department finds credible the assertion that out-of-state retailers currently have a price advantage due to not charging sales tax and by effectively using their in-state competitors as show rooms. Additionally, out-of-state sellers would be unable to deliver their products into Tennessee without its infrastructure, which is supported by the State's tax revenues. Out-of-state sellers who send products into Tennessee without contributing to the maintenance of the State's infrastructure enjoy an advantage over those sellers who do contribute.

Regulatory Flexibility Addendum

Pursuant to T.C.A. §§ 4-5-401 through 4-5-404, prior to initiating the rule making process, all agencies shall conduct a review of whether a proposed rule or rule affects small business.

(1) Types of small businesses directly affected:

The amendment of Rule 1320-05-01-.63 has no impact on small business. New Rule 1320-05-01-.129 does not apply to small businesses. To be subject to the rule's registration and tax collection requirements, a seller without a physical presence in Tennessee must make more than \$500,000 in sales into Tennessee in a twelve-month period. Given that it is very unlikely that a seller without a physical presence in Tennessee will make sales solely into Tennessee, out-of-state businesses who meet the \$500,000 Tennessee threshold are likely to have total sales that far exceed that amount.

(2) Projected reporting, recordkeeping, and other administrative costs:

The amendment of Rule 1320-05-01-.63 creates no added reporting, recordkeeping, and other administrative costs. New Rule 1320-05-01-.129 requires certain out-of-state dealers who currently do not collect Tennessee sales and use tax to register with the Department of Revenue and begin to collect and remit the tax. Additional reporting and recordkeeping costs for these dealers will depend on various factors such as whether the dealer files its own returns or uses a vendor, and whether the dealer already remits sales and use tax in multiple states. Compliance with Tennessee's sales and use tax is simpler than in many other states because these dealers would collect the uniform state rate and could opt to collect a uniform local rate, eliminating any administrative complexity of collecting multiple jurisdictional rates.

(3) Probable effect on small businesses:

These rules do not have a negative effect on small businesses. New Rule 1320-05-01-.129 has a positive impact on small businesses in Tennessee that directly compete with out-of-state dealers.

(4) Less burdensome, intrusive, or costly alternative methods:

There is no less burdensome, intrusive, or costly alternative method available outside of these rules.

(5) Comparison with federal and state counterparts:

Alabama and South Dakota have promulgated similar provisions. Alabama promulgated Sales and Use Tax Rule 810-6-2-.90.03, effective January 1, 2016, which imposes a collection obligation on out-of-state sellers who had \$250,000 or more in retail sales sold into Alabama in the previous year and engage in one or more of the activities listed in Ala. Code § 40-23-68. South Dakota imposed similar requirements effective May 1, 2016, through South Dakota SB 106, whereby an out-of-state seller with no physical location within the state must remit sales tax if it has gross revenues from sales of tangible property, any products transferred electronically, or services delivered into South Dakota exceeding \$100,000 or it has 200 or more separate transactions of tangible property, products transferred electronically, or services delivered into South Dakota.

(6) Effect of possible exemption of small businesses:

Small businesses are effectively exempted from New Rule 1320-05-01-.129, through application of the \$500,000 threshold spelled out in the rule.

Impact on Local Governments

Pursuant to T.C.A. §§ 4-5-220 and 4-5-228 “any rule proposed to be promulgated shall state in a simple declarative sentence, without additional comments on the merits of the policy of the rules or regulation, whether the rule or regulation may have a projected impact on local governments.” (See Public Chapter Number 1070 (<http://state.tn.us/sos/acts/106/pub/pc1070.pdf>) of the 2010 Session of the General Assembly)

As a result of increased compliance with local tax laws by out-of-state dealers, New Rule 1320-05-01-.129 will increase local revenue without any additional local expenditures or administrative burdens.

Additional Information Required by Joint Government Operations Committee

All agencies, upon filing a rule, must also submit the following pursuant to T.C.A. § 4-5-226(i)(1).

- (A)** A brief summary of the rule and a description of all relevant changes in previous regulations effectuated by such rule;

New Rule 1320-05-01-.129 sets out sales and use tax registration and collection requirements for out-of-state dealers who regularly and systematically solicit business in Tennessee and who made more than \$500,000 in sales in Tennessee during the previous twelve-month period. These dealers must register for sales and use tax by March 1, 2017, and begin to collect and remit tax by July 1, 2017, or a later date set by the Department. An out-of-state dealer who meets the \$500,000 threshold after March 1, 2017, must register and begin to collect tax by the first day of the third calendar month following the month in which the dealer met the threshold.

Rule 1320-05-01-.63 is amended by moving the content of subsection (2) to New Rule 1320-05-01-.129 for clarity and taxpayer convenience.

- (B)** A citation to and brief description of any federal law or regulation or any state law or regulation mandating promulgation of such rule or establishing guidelines relevant thereto;

No state or federal law or regulation requires the promulgation of New Rule 1320-05-01-.129 or the amendment of Rule 1320-05-01-.63. Tenn. Code Ann. §§ 67-1-102 and 67-6-402 give the Commissioner of the Department of Revenue the power to prescribe rules.

- (C)** Identification of persons, organizations, corporations or governmental entities most directly affected by this rule, and whether those persons, organizations, corporations or governmental entities urge adoption or rejection of this rule;

Out-of-state dealers making sales of more than \$500,000 in Tennessee in any twelve-month period are subject to these rules and therefore directly affected by them. Local governments are also directly affected by these rules, because compliance with the sales tax laws has a direct effect on local tax revenues.

A number of out-of-state dealers that do not currently collect Tennessee sales tax have urged rejection of the rule. A number of in-state dealers who sell online into other states have urged rejection of the rule, expressing concern that other states might impose similar compliance requirements on them in the future.

A number of in-state dealers have urged adoption of the rule because of the unfair competitive advantage out-of-state dealers maintain by not having to collect and remit Tennessee's sales and use tax. Several local Chambers of Commerce have urged adoption of the rule. Certain retail associations have urged adoption of the rule. Every local government that has contacted the Department urges adoption of the rule because of increased local revenue projections.

- (D)** Identification of any opinions of the attorney general and reporter or any judicial ruling that directly relates to the rule or the necessity to promulgate the rule;

Judicial decisions that directly relate to the substance of the rule include the U.S. Supreme Court opinions in *Quill v. North Dakota*, 504 U.S. 298 (1992), and *National Bellas Hess v. Department of Revenue*, 386 U.S. 753 (1967). Judicial decisions that relate to the promulgation of the rule include *Direct Marketing Association v. Brohl*, 135 S. Ct. 1124 (2015).

The Attorney General and Reporter has not issued an opinion that directly relates to the rule.

In 1992, the U.S. Supreme Court in *Quill* held that North Dakota had created an unconstitutional burden on interstate commerce, in violation of the dormant Commerce Clause, by requiring an out-of-state catalogue business with no physical presence in North Dakota to collect a use tax from its North Dakota customers, because that business lacked a "substantial nexus" with North Dakota. In doing so, the Court adhered to its 1967 decision in *National Bellas Hess*, while acknowledging that the physical-presence rule *Bellas Hess* adopted was "artificial" and inconsistent with the Court's "contemporary Commerce Clause jurisprudence."

Justice Kennedy in his concurring opinion in the 2015 case *Direct Marketing Association v. Brohl* stated that the

“Internet has caused far-reaching systemic and structural changes in the economy” in the years since *Quill* was decided, and there is a strong case to be made that “a business may [now] be present in a State in a meaningful way without that presence being physical in the traditional sense of the term.” Justice Kennedy expressly invited the legal system to find an appropriate case for the U.S. Supreme Court to reexamine *Quill* and *Bellas Hess*.

Given these developments, the Department believes that the out-of-state businesses to whom the proposed rule would apply have a “substantial nexus” with the State of Tennessee and therefore may be required to collect and remit sales tax from their Tennessee customers.

- (E) An estimate of the probable increase or decrease in state and local government revenues and expenditures, if any, resulting from the promulgation of this rule, and assumptions and reasoning upon which the estimate is based. An agency shall not state that the fiscal impact is minimal if the fiscal impact is more than two percent (2%) of the agency's annual budget or five hundred thousand dollars (\$500,000), whichever is less;

The Department estimates that the promulgation of the rule will increase state and local revenue by at least \$200 million per year when full compliance is reached, with no additional state or local expenditures. Due to pending litigation in other states and potential litigation in Tennessee on this issue, it is unknown how many dealers will choose not to register and collect tax pending the outcome of the litigation.

- (F) Identification of the appropriate agency representative or representatives, possessing substantial knowledge and understanding of the rule;

David Gerregano, Deputy Commissioner
Kristin Husat, Assistant Commissioner and General Counsel
Barbara Sampson, Assistant Commissioner

- (G) Identification of the appropriate agency representative or representatives who will explain the rule at a scheduled meeting of the committees;

David Gerregano, Deputy Commissioner
Kristin Husat, Assistant Commissioner and General Counsel
Barbara Sampson, Assistant Commissioner

- (H) Office address, telephone number, and email address of the agency representative or representatives who will explain the rule at a scheduled meeting of the committees; and

Office Address (all three representatives): Tennessee Department of Revenue, Andrew Jackson Building, 500 Deaderick Street, 11th Floor, Nashville, TN 37242

David Gerregano: (615) 532-8967; David.Gerregano@tn.gov
Kristin Husat: (615) 741-2348; Kristin.Husat@tn.gov
Barbara Sampson: (615) 532-6015; Barbara.Sampson@tn.gov

- (I) Any additional information relevant to the rule proposed for continuation that the committee requests.

The Department of Revenue is not aware of any request for additional relevant information.

**Department of State
Division of Publications**

312 Rosa L. Parks Avenue, 8th Floor Snodgrass/TN Tower
Nashville, TN 37243
Phone: 615-741-2650
Email: publications.information@tn.gov

For Department of State Use Only

Sequence Number: 10-02-16
Rule ID(s): 6329
File Date: 10/3/16
Effective Date: 1/1/17

Rulemaking Hearing Rule(s) Filing Form

Rulemaking Hearing Rules are rules filed after and as a result of a rulemaking hearing (Tenn. Code Ann. § 4-5-205).

Pursuant to Tenn. Code Ann. § 4-5-229, any new fee or fee increase promulgated by state agency rule shall take effect on July 1, following the expiration of the ninety (90) day period as provided in § 4-5-207. This section shall not apply to rules that implement new fees or fee increases that are promulgated as emergency rules pursuant to § 4-5-208(a) and to subsequent rules that make permanent such emergency rules, as amended during the rulemaking process. In addition, this section shall not apply to state agencies that did not, during the preceding two (2) fiscal years, collect fees in an amount sufficient to pay the cost of operating the board, commission or entity in accordance with § 4-29-121(b).

Agency/Board/Commission:	Tennessee Department of Revenue
Division:	
Contact Person:	Lauren Fields, Associate General Counsel and Assistant Director– Legal
Address:	Andrew Jackson Building, 500 Deaderick Street, 11 th Floor Nashville, TN
Zip:	37242
Phone:	(615) 741-2348
Email:	Lauren.Fields@tn.gov

Revision Type (check all that apply):

- Amendment
 New
 Repeal

Rule(s) (ALL chapters and rules contained in filing must be listed here. If needed, copy and paste additional tables to accommodate multiple chapters. Please make sure that ALL new rule and repealed rule numbers are listed in the chart below. Please enter only ONE Rule Number/Rule Title per row)

Chapter Number	Chapter Title
1320-05-01	State Sales and Use Tax Rules
Rule Number	Rule Title
1320-05-01-.63	Registration Certificate
1320-05-01-.129	Out-of-State Dealers

(Place substance of rules and other info here. Please be sure to include a detailed explanation of the changes being made to the listed rule(s). Statutory authority must be given for each rule change. For information on formatting rules go to http://sos.tn.gov/sites/default/files/forms/Rulemaking_Guidelines_August2014.pdf)

Chapter 1320-05-01
Sales and Use Tax Rules

Amendment

1320-05-01-.63 Registration Certificate.

(1) Sales Tax.

- (a) When a dealer changes his business location within the same county, the certificate holder shall notify the Department of the new business address and surrender his Registration Certificate. A new certificate will be issued showing the correct business address.
- (b) When a dealer changes his business location to a different county, or to a different type of business, the certificate must be submitted for cancellation, and an application for a new certificate filed.

~~(2) Use Tax.~~

~~(a) Out-of-state dealers which have a sufficient jurisdictional contact or nexus with this State, and accept orders from residents of this State, shall register with the Department for use tax purposes, and report and pay the appropriate use tax to the Department. Other out-of-state dealers should register with the Department for the purpose of reporting and collecting use tax as a convenience and service to their customers.~~

~~(b) Persons importing taxable tangible personal property into the State, and who do not pay the Tennessee use tax to an out-of-state dealer registered with this Department, shall register with the Department for use tax purposes, and report and pay the appropriate use tax to the Department. Except as otherwise provided in these rules and regulations, such persons must pay use tax to out-of-state dealers who are properly registered with this Department, rather than declare such purchases and pay the tax themselves.~~

~~(3) Dealers within the State having both sales and use tax to report shall register for sales tax purposes, and report sales and use tax on forms provided for such purposes.~~

~~(43) Dealers having average monthly gross sales of \$400.00 or less and taxable services of \$100.00 or less may in the discretion of the Commissioner of Revenue be required to pay tax to their suppliers on purchases in lieu of registering for sales and use tax purposes since the Department's cost of administering the account would exceed the taxes reported.~~

~~(54) An individual property owner who sells, rents, or charges for the occupation of a room, lodging, or accommodation for a period of less than ninety (90) continuous days and a property management company that is required to collect sales and use tax on behalf of an individual property owner as required by T.C.A. §67-6-501 shall file with the Commissioner an application for a certificate of registration for each property that it owns or manages. If an individual property owner owns or a property management company manages multiple locations within one local jurisdiction, the individual property owner or the property management company shall be required to register only one location per local jurisdiction and report all sales in that local jurisdiction to the registered location.~~

Authority: T.C.A. §§67-1-102, 67-6-~~402~~205, 67-6-~~205~~402, and 67-6-501.

New

1320-05-01-.129 Out-of-State Dealers.

- (1) Out-of-state dealers with a physical presence in Tennessee have a substantial nexus with this state. These dealers shall register with the Department for sales and use tax purposes and shall report and pay the appropriate tax to the Department on sales of tangible personal property and other taxable items delivered to consumers in this state.
- (2) Out-of-state dealers who engage in the regular or systematic solicitation of consumers in this state through any means and make sales that exceed \$500,000 to consumers in this state during the previous twelve-month period also have a substantial nexus with this state.
- (a) By March 1, 2017, these dealers, if they have not already done so, shall register with the Department for sales and use tax purposes and thereby affirmatively acknowledge that they will collect and remit sales and use taxes to the Department beginning July 1, 2017. Beginning July 1, 2017, unless a later date is established by the Department by notice, these dealers shall report and pay the appropriate tax to the Department on sales of tangible personal property and other taxable items delivered to consumers in this state.
- (b) Dealers who meet the \$500,000 threshold after March 1, 2017, shall register with the Department and begin to collect and remit Tennessee sales and use tax by the first day of the third calendar month following the month in which the dealer met the threshold. In no case, however, shall such dealers be required to collect and remit sales and use taxes to the Department for periods before July 1, 2017.
- (3) Persons who purchase tangible personal property or other taxable items from any dealer that is registered with the Department must pay Tennessee sales and use tax to the dealer, unless the sale is otherwise exempt. Persons who import tangible personal property or other taxable items into this state and have not paid the sales and use tax to the dealer shall report and pay the use tax directly to the Department, unless the sale is otherwise exempt.

Authority: T.C.A. §§67-1-102, 67-6-402, and 67-6-501.

* If a roll-call vote was necessary, the vote by the Agency on these rulemaking hearing rules was as follows:

Board Member	Aye	No	Abstain	Absent	Signature (if required)
Not Applicable					

I certify that this is an accurate and complete copy of rulemaking hearing rules, lawfully promulgated and adopted by the Tennessee Department of Revenue on 09/27/2016, and is in compliance with the provisions of T.C.A. § 4-5-222.

I further certify the following:

Notice of Rulemaking Hearing filed with the Department of State on: 06/16/16

Rulemaking Hearing(s) Conducted on: (add more dates). 08/08/16

Date: 9-28-16

Signature: Richard H. Roberts

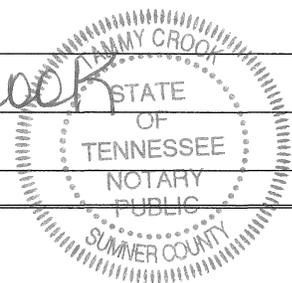
Name of Officer: Richard H. Roberts

Title of Officer: Commissioner

Subscribed and sworn to before me on: 9-28-16

Notary Public Signature: Jammy Crook

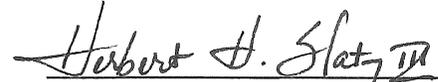
My commission expires on: 12-18-2017



Chapter 1320-05-01 State Sales and Use Tax Rules

Rule 1320-05-01-.63 Registration Certificate
Rule 1320-05-01-.129 Out-of-State Dealers

All rulemaking hearing rules provided for herein have been examined by the Attorney General and Reporter of the State of Tennessee and are approved as to legality pursuant to the provisions of the Administrative Procedures Act, Tennessee Code Annotated, Title 4, Chapter 5.

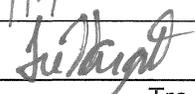


Herbert H. Slatery III
Attorney General and Reporter
9/30/2016

Date

Department of State Use Only

Filed with the Department of State on: 10/3/16

Effective on: 1/1/17


Tre Hargett
Secretary of State

RECEIVED
2016 OCT -3 PM 1:09
SECRETARY OF STATE
PUBLICATIONS

G.O.C. STAFF RULE ABSTRACT

DEPARTMENT: Finance and Administration

DIVISION: Bureau of TennCare

SUBJECT: TennCare Long-Term Care Programs

STATUTORY AUTHORITY: Tennessee Code Annotated, Sections 4-5-202, 71-5-105, and 71-5-109

EFFECTIVE DATES: December 29, 2016 through June 30, 2017

FISCAL IMPACT: The promulgation of these rules is anticipated to decrease state government expenditures by \$755,000, as reported in the Health Care Finance and Administration Fiscal Year Budget Reduction Plan and incorporated into the Appropriations Act.

STAFF RULE ABSTRACT: These rulemaking hearing rules are being promulgated to replace emergency rules which clarified requirements for providers of services and the payment methodology for enhanced respiratory care services provided under TennCare Long-Term Care Programs.

Public Hearing Comments

One copy of a document containing responses to comments made at the public hearing must accompany the filing pursuant to T.C.A. § 4-5-222. Agencies shall include only their responses to public hearing comments, which can be summarized. No letters of inquiry from parties questioning the rule will be accepted. When no comments are received at the public hearing, the agency need only draft a memorandum stating such and include it with the Rulemaking Hearing Rule filing. Minutes of the meeting will not be accepted. Transcripts are not acceptable.

HCFA received comments from six individuals or entities concerning these rules. The comments and HCFA's responses to the comments are summarized below.

Several commenters expressed concern about the requirement in the rule for a new PreAdmission Evaluation (PAE) every 30 days for tracheal suctioning patients. These commenters suggested that the requirement is unduly onerous, or would not allow for timely authorization for current ERC patients. In response, HCFA modified the rule in order to allow longer timeframes on a case-by-case basis for patients with certain conditions.

Several commenters expressed concern that a significant number of hospital referrals would be denied admission to certain facilities due to inability to meet patients' needs with the new reimbursement structure. HCFA clarified that it does not anticipate that the changes implemented by the rule will increase denials of referral for hospital admission, except where appropriate. HCFA noted that one of the most serious concerns observed in onsite reviews was the lack of clear admission criteria that would ensure patients were stable enough for transfer from the hospital to the facility prior to admission. The rule includes admission criteria requirements, and also includes hospital readmissions and unanticipated deaths as quality outcomes measures in part to help address these concerns.

Several commenters expressed concern that quality rankings which partially depend on weaning rates was unfair to facilities which provide services for unweanable patients, such as individuals with neuromuscular disease. HCFA noted that liberation from a ventilator—the primary objective of the ERC program since its inception—is a critical quality outcome measure with tremendous potential to impact the quality of life of individuals with chronic respiratory needs.

Several commenter expressed concern that the quality data were not verified by a third party. HCFA noted the extensive training, technical assistance, measurement, review, and notification activities that contributed to the establishment of initial ERC program benchmarks and setting the initial quality-adjusted reimbursement rates. One commenter indicated that the fiscal impact of these rules would be detrimental to facilities providing ERC services and recommended that the rule not be adopted. HCFA noted the need to managed spending growth in the area of ERC services, and the need to implement the budget reduction required by the FY 2016-2017 budget. HCFA also noted, however, that the primary focus of the rule is to improve the quality of care and quality of life experienced by individuals with ERC needs. HCFA reiterated the extensive planning and public notice activities that contributed to the development of the rule. Several other commenters suggested that the calculated savings associated with these rules were "short-sighted" and did not account for cost savings in other settings, such as HCBS, long-term acute care, and hospitals. HCFA noted the need to manage spending growth in enhanced respiratory care settings at a sustainable level over time.

One commenter suggested that the requirements for carbon dioxide monitoring for ventilator and tracheostomy patients in the rule exceed the monitoring that occurs in intensive care units and questioned the appropriateness of the requirements. HCFA disagreed that it is appropriate to compare skilled nursing facilities to intensive care settings, which typically have a one-to-one caregiver-to-patient ratio and more advanced monitoring resources. HCFA maintains that the requirements in the rule are appropriate and necessary to ensure patient safety.

Several commenters requested information about the basis for the requirement in the rule for a minimum of 12 hours of non-invasive ventilator support to qualify for ventilator reimbursement. In response, HCFA noted that this requirement is not a standard of care, but rather a requirement for receiving higher ERC reimbursement.

One commenter asked that the requirement in the rule for suctioning every three hours to qualify for Secretion Management reimbursement was excessive. Another commenter noted that pneumonias are possible in patients with minimal secretions. In response, HCFA noted that nursing facilities have long provided for the routine suctioning needs of their patients, and that the higher level of reimbursement for Secretion Management is intended for those patients who have excessive volumes of secretions, or who would have such volumes absent

the use of appropriate airway clearance devices. HCFA modified the rule to provide additional clarity about what constitutes a copious volume of secretions and the frequency of suctioning or airway clearance.

One commenter suggested that the three-times-a-day requirement for mechanical airway clearance in the rule is excessive. In response, HCFA noted that not every patient who requires some level of suctioning or airway clearance will need such assistance three times a day, and the higher level of reimbursement for Secretion Management is intended for those patients who have excessive volumes of secretions, or who would have such volumes absent the use of appropriate airway clearance devices.

One commenter suggested that other modalities for airway management, such as saline-triggered cough in neuro-impaired patients and the management of excessive oral secretions in neuromuscular patients, should be included in HCFA airway clearance policies. HCFA referred the commenter to AARP Guidelines for Endotracheal Suctioning of Mechanically Ventilated Patients with Artificial Airways, and noted that these alternative modalities for airway management should not be routinely performed prior to performing endotracheal suctioning.

One commenter questioned the basis for certain changes to the definitions of particular services. In response, HCFA noted that these definitions have been in place since 2010 and are not changed by this rule, except to distinguish between the different types of Tracheal Suctioning Reimbursement – Sub-Acute and Secretion Management – and to include (based on clinical best practices) the ability to approve Ventilator Care reimbursement under certain circumstances for individuals who are ventilated using noninvasive positive pressure ventilation by mask or mouthpiece for at least 12 hours each day in order to avoid or delay tracheostomy.

One commenter suggested that the provision of the rule that specifies that TennCare MCOs will not contract with any nursing facility for ERC services unless such NF was contracted by the MCO for ERC as of July 1, 2016, was contrary to state law. In response, HCFA modified the rule to clarify that the provision in question addresses reimbursement of nursing facilities for ERC services, not contracts with nursing facilities.

One commenter expressed concern about the provision in the rule concerning the responsibility of nursing facilities for arranging Medicaid reimbursement for ERC services from other states, as appropriate, when individuals from other states are placed in Tennessee facilities. This commenter suggested that the rule be modified to only apply when another state requests placements in Tennessee facilities for one of their citizens. HCFA noted that federal regulation establishes the responsibilities of nursing facilities relating to placements in out-of-state institutions.

One commenter objected to the rule on the basis that TennCare should not "take over the management role in respiratory units." In response, HCFA noted that the rule does not purport to assume management of any healthcare provider, and emphasized the intent of the rule to use public resources responsibly and to support the delivery of high-quality care by establishing reasonable expectations regarding standards of care and outcomes facilities should demonstrate in order to receive enhanced reimbursement.

One commenter suggested that facilities' quality rankings should not be based in part on the availability of certain types of equipment, on the basis that not all facilities can afford certain equipment. In response, HCFA noted that the higher rates of reimbursement paid for ERC services carry a reasonable expectation of investment in the technologies and staff needed to provide quality care and achieve quality outcomes. This commenter specifically suggested that beepers/pagers are not necessary when facility staff remain in the patient area. HCFA noted that beepers/pagers are not required by the rule, but that the rule is intended to recognize facilities that upgrade to more advanced warning/safety technology.

One commenter suggested that the end-tidal carbon dioxide (ETCO₂) monitoring requirements in the rule are "unwarranted." In response, HCFA noted that the requirements are based on clinical guidance, and that the efficacy of such guidelines has been documented in multiple studies. Another commenter objected to the rule on the basis that the requirements in the rule do not reflect evidence-based medical requirements. In response, HCFA noted the extensive involvement of nationally recognized experts in the development of the rule. One commenter suggested that the PreAdmission Evaluation (PAE) process is slow and time-consuming. In response, HCFA noted that the PAE process is not affected by this rule. HCFA continues to process PAEs within no more than eight business days, and typically much faster.

One commenter suggested that the 10LPM concentrator requirement for all ventilator patients is "unwarranted." In response, HCFA noted that this is not a requirement of this rule. Rather, it is a requirement by Health Care Facilities, the licensing and certification entity, when there is no piped gas in the facility, and outside the scope of this rulemaking.

Regulatory Flexibility Addendum

Pursuant to T.C.A. §§ 4-5-401 through 4-5-404, prior to initiating the rule making process, all agencies shall conduct a review of whether a proposed rule or rule affects small business.

The rules are not anticipated to have an effect on small businesses.

Impact on Local Governments

Pursuant to T.C.A. §§ 4-5-220 and 4-5-228 "any rule proposed to be promulgated shall state in a simple declarative sentence, without additional comments on the merits of the policy of the rules or regulation, whether the rule or regulation may have a projected impact on local governments." (See Public Chapter Number 1070 (<http://state.tn.us/sos/acts/106/pub/pc1070.pdf>) of the 2010 Session of the General Assembly)

The rules are not anticipated to have an impact on local governments.

Additional Information Required by Joint Government Operations Committee

All agencies, upon filing a rule, must also submit the following pursuant to T.C.A. § 4-5-226(i)(1).

- (A) A brief summary of the rule and a description of all relevant changes in previous regulations effectuated by such rule;

These rules are being promulgated to replace emergency rules which clarified the requirements which must be met by providers of services as well as the payment methodology for reimbursement for Enhanced Respiratory Care services provided through the TennCare Long-Term ^{Care} ~~Services and Support~~ program.

- (B) A citation to and brief description of any federal law or regulation or any state law or regulation mandating promulgation of such rule or establishing guidelines relevant thereto;

The Rules are lawfully adopted by the Bureau of TennCare in accordance with §§ 4-5-202, 71-5-105 and 71-5-109.

- (C) Identification of persons, organizations, corporations or governmental entities most directly affected by this rule, and whether those persons, organizations, corporations or governmental entities urge adoption or rejection of this rule;

The persons and entities most directly affected by these Rules are the TennCare enrollees, providers, and managed care contractors. The governmental entity most directly affected by these Rules is the Bureau of TennCare, Tennessee Department of Finance and Administration.

- (D) Identification of any opinions of the attorney general and reporter or any judicial ruling that directly relates to the rule or the necessity to promulgate the rule;

The Rules were approved by the Tennessee Attorney General. No additional opinion was given or requested.

- (E) An estimate of the probable increase or decrease in state and local government revenues and expenditures, if any, resulting from the promulgation of this rule, and assumptions and reasoning upon which the estimate is based. An agency shall not state that the fiscal impact is minimal if the fiscal impact is more than two percent (2%) of the agency's annual budget or five hundred thousand dollars (\$500,000), whichever is less;

The promulgation of these rules is anticipated to decrease state government expenditures by \$755,500, as reported in the Health Care Finance and Administration Fiscal Year Budget Reduction Plan and incorporated in the Appropriations Act.

- (F) Identification of the appropriate agency representative or representatives, possessing substantial knowledge and understanding of the rule;

Donna K. Tidwell
Deputy General Counsel

- (G) Identification of the appropriate agency representative or representatives who will explain the rule at a scheduled meeting of the committees;

Donna K. Tidwell
Deputy General Counsel

- (H) Office address, telephone number, and email address of the agency representative or representatives who will explain the rule at a scheduled meeting of the committees; and

310 Great Circle Road
Nashville, TN 37243
(615) 507-6852
donna.tidwell@tn.gov

(l) Any additional information relevant to the rule proposed for continuation that the committee requests.

--

GW10216214pk.dkt

Department of State
Division of Publications
 312 Rosa L. Parks Avenue, 8th Floor Snodgrass/TN Tower
 Nashville, TN 37243
 Phone: 615-741-2650
 Email: publications.information@tn.gov

For Department of State Use Only

Sequence Number: 09-38-16
 Rule ID(s): 6323
 File Date: 9/30/16
 Effective Date: 12/29/16

Rulemaking Hearing Rule(s) Filing Form

Rulemaking Hearing Rules are rules filed after and as a result of a rulemaking hearing (Tenn. Code Ann. § 4-5-205).

Pursuant to Tenn. Code Ann. § 4-5-229, any new fee or fee increase promulgated by state agency rule shall take effect on July 1, following the expiration of the ninety (90) day period as provided in § 4-5-207. This section shall not apply to rules that implement new fees or fee increases that are promulgated as emergency rules pursuant to § 4-5-208(a) and to subsequent rules that make permanent such emergency rules, as amended during the rulemaking process. In addition, this section shall not apply to state agencies that did not, during the preceding two (2) fiscal years, collect fees in an amount sufficient to pay the cost of operating the board, commission or entity in accordance with § 4-29-121(b).

Agency/Board/Commission:	Tennessee Department of Finance and Administration
Division:	Bureau of TennCare
Contact Person:	George Woods
Address:	310 Great Circle Road
Zip:	37243
Phone:	(615) 507-6446
Email:	george.woods@tn.gov

Revision Type (check all that apply):

- Amendments
 New
 Repeal

Rule(s) (ALL chapters and rules contained in filing must be listed here. If needed, copy and paste additional tables to accommodate multiple chapters. Please make sure that ALL new rule and repealed rule numbers are listed in the chart below. Please enter only ONE Rule Number/Rule Title per row)

Chapter Number	Chapter Title
1200-13-01	TennCare Long-Term Care Programs
Rule Number	Rule Title
1200-13-01-.02	Definitions
1200-13-01-.03	Nursing Facility (NF) Provider Reimbursement
1200-13-01-.05	TennCare CHOICES Program
1200-13-01-.10	Medical (Level of Care) Eligibility Criteria for TennCare Reimbursement of Care in Nursing Facilities, CHOICES HCBS and PACE

Rules
of
Tennessee Department of Finance
and Administration
Bureau of TennCare

Chapter 1200-13-01
TennCare Long-Term Care Programs

1200-13-01-.02 Definitions.

Enhanced Respiratory Care (ERC). Specialized types of assistance provided to individuals with certain significant respiratory care needs as part of the medically necessary services delivered in an appropriately licensed and dual certified NF/SNF, consisting of Ventilator Weaning, Chronic Ventilator Care, or Tracheal Suctioning including Sub-Acute and Secretion Management, and for which a NF may, pursuant to these rules, be eligible to receive Enhanced Respiratory Care Reimbursement.

(45) Enhanced Respiratory Care Reimbursement. Specified levels of reimbursement (i.e., Ventilator Weaning, Chronic Ventilator Care, and Tracheal Suctioning, and Ventilator Weaning including Sub-Acute and Secretion Management) provided for NF ERC services delivered by a dual certified NF/SNF that meets the requirements set forth in Rule 1200-13-01-.03(5) to persons determined by the Bureau or an MCO to meet specified medical eligibility or medical necessity criteria for such level of reimbursement.

(145) Tracheal Suctioning Reimbursement. The rate of reimbursement provided for NF services, including enhanced respiratory care assistance, delivered by a dual certified NF/SNF that meets the requirements set forth in Rule 1200-13-01-.03(5), to residents determined by the Bureau to meet the medical eligibility criteria set forth in Rule 1200-13-01-.10(5)(e) or determined by an their TennCare MCO to require short-term intensive respiratory intervention during the post-weaning period, which shall include documented progress in weaning from the tracheostomy. Tracheal Suctioning Reimbursement shall include two (2) distinct levels of reimbursement as follows:

(a) Secretion Management Tracheal Suctioning Reimbursement for services delivered by a dual certified NF/SNF to persons who meet the medical eligibility criteria set forth in Rule 1200-13-01-.10(5)(e) and have an approved PAE for such level of reimbursement; and

(b) Sub-Acute Tracheal Suctioning Reimbursement for short-term intensive respiratory intervention delivered by a dual certified NF/SNF and determined by the person's TennCare MCO to be medically necessary during the post-weaning period, which shall include documented progress in weaning from the tracheostomy. Because Sub-Acute Tracheal Suctioning Reimbursement provides for intensive respiratory intervention during the period immediately following a person's liberation from the ventilator, Sub-Acute Tracheal Suctioning Reimbursement shall be provided only in a bed specifically licensed for ventilator care.

1200-13-01-.03 Nursing Facility (NF) Provider Reimbursement.

(2) Level 1, Level 2, and Enhanced Respiratory Care NF Reimbursement.

(a) Reimbursement for NF services provided to a Medicaid Eligible member enrolled in the TennCare Program shall be categorized according to the needs of the individual and the level of skilled and/or rehabilitative services required as specified in Rule 1200-13-01-.10.

(b) Level 2 or Enhanced Respiratory Care NF Reimbursement shall be provided only for beds that are certified for by both Medicaid and Medicare for the provision of NF/SNF (Level 2) care.

(c) Effective July 1, 2016, each level of Enhanced Respiratory Care Reimbursement shall be an add-on payment to the NF's established Level 2 per diem rate or the NF's blended per diem rate, when established. The amount of the NF's add-on payment for each of the specified levels of reimbursement shall be based on the facility's performance on quality outcome and technology measures pursuant to a methodology established by TennCare. Quality outcome and technology

measures, performance benchmarks, and the methodology to apply such measures and benchmarks to each of the specified levels of Enhanced Respiratory Care Reimbursement may be adjusted during FY 2016-2017 to ensure compliance with the Appropriations Act, Public Chapter 758, and no more frequently than annually thereafter in order to continuously improve the quality of care and quality of life outcomes experienced by individuals receiving Enhanced Respiratory Care in a NF.

- (d) Enhanced Respiratory Care Reimbursement shall be provided only for services authorized and delivered in a facility operating in compliance with conditions of reimbursement for Enhanced Respiratory Care specified in this rule, and in a bed specifically licensed for such purpose, as applicable. A NF shall not be eligible for Enhanced Respiratory Care Reimbursement if it does not meet the conditions for reimbursement, or for any Enhanced Respiratory Care services provided in excess of the facility's licensed capacity to provide such services, regardless of payer source. Because Sub-Acute Tracheal Suctioning Reimbursement provides for intensive respiratory intervention during the period immediately following a person's liberation from the ventilator, Sub-Acute Tracheal Suctioning Reimbursement shall be provided only in a bed specifically licensed for ventilator care.
- (e) A NF shall be eligible for Enhanced Respiratory Care Reimbursement only if the facility has submitted complete, accurate and timely quality measurement data as required by TennCare in order to determine the NF's quality performance.
1. Quality measurement data shall be submitted by the NF on a monthly basis.
 2. A NF's add-on per diem payment for each specified level of Enhanced Respiratory Care Reimbursement provided for NF services shall be adjusted based on the NF's quality performance no more frequently than semi-annually.
 3. A NF shall not be entitled to Enhanced Respiratory Care Reimbursement for any NF services provided if the facility has not complied with quality performance reporting requirements, or if any such data is determined (including upon post-payment audit or review) to be inaccurate or incomplete.
 4. Any facility submitting false (including inaccurate or incomplete) quality performance data for purposes of Medicaid payment shall be subject to all applicable federal and state laws pertaining to the submission of false claims.
- (5) Conditions for Reimbursement of Enhanced Respiratory Care Reimbursement.
- (a) The Level 2 NF must enter into a provider agreement with one or more TennCare MCOs for the provision and reimbursement of ventilator weaning, chronic ventilator services and/or tracheal suctioning in a level-2-certified and licensed NF-ERC in a dual certified and licensed NF/SNF.
1. A TennCare MCO shall, pursuant to T.C.A. § 71-5-1412, as amended, contract with any nursing facility for the provision of Medicaid NF services, but shall not be obligated to reimburse any NF for Enhanced Respiratory Care.
 2. Unless an exception is granted, a TennCare MCO shall not reimburse any NF for Enhanced Respiratory Care unless such NF was contracted by the MCO for Enhanced Respiratory Care Reimbursement as of July 1, 2016. An MCO may request an exception from TennCare to the moratorium on reimbursement for Enhanced Respiratory Care upon the MCO's demonstration of the need for additional capacity or improved quality in the geographic area in which the NF is located, and the NF's compliance with all applicable conditions of Enhanced Respiratory Care Reimbursement specified in this paragraph.
- (b) NFs providing (Medicare SNFs and TennCare NFs providing enhanced respiratory care services in a Level-2 NF) must be certified by Medicare, showing they have met the federal certification standards. Enhanced Respiratory Care services must be dual certified for the provision of Medicare SNF and Medicaid NF services, showing they have met the federal certification standards. Any of these NFs participating in the TennCare Program shall be terminated by all TennCare MCOs as a TennCare provider if certification or licensure is canceled by CMS or the State.

- (c) NFs providing Ventilator Weaning or Chronic Ventilator Care services and NFs receiving short-term reimbursement at the Sub-Acute Tracheal Suctioning Rate for a person who has just been weaned from the ventilator, but who still requires short-term intensive respiratory intervention, shall ~~also~~ meet or exceed the following minimum standards:

1. The NF shall ensure that medical direction of all Ventilator Weaning, Chronic Ventilator Care, and Sub-Acute Tracheal Suctioning services is provided by a physician licensed to practice in the State of Tennessee and board certified in pulmonary disease or critical care medicine as recognized by either the American Board of Medical Specialties or American Osteopathic Association, as applicable.

42. A licensed respiratory care practitioner as defined by T.C.A. § 63-27-102(7), shall be on site in the ventilator care unit twenty four (24) hours per day, seven (7) days per week to provide:

- (i) Ventilator care;
- (ii) Administration of medical gases;
- (iii) Administration of aerosol medications; and
- (iv) Diagnostic testing and monitoring of life support systems.

23. ~~The NF shall ensure that an appropriate individualized POC is prepared for each resident requiring ventilator services~~ receiving Ventilator Weaning, Chronic Ventilator Care, or Sub-Acute Tracheal Suctioning. The POC shall be developed with input and participation from the medical director of the NF's Enhanced Respiratory Care program as described in Part 1 a pulmonologist or a physician with experience in ventilator care.

34. The NF shall establish admissions criteria to ensure the medical stability of ventilator-dependent residents prior to transfer from an acute care setting. The NF shall maintain documentation regarding the clinical evaluation of each resident who will receive Enhanced Respiratory Care for appropriateness of placement in the facility prior to admission.

45. End tidal carbon dioxide (etCO₂) or transcutaneous monitoring of carbon dioxide and oxygen (tcCO₂) and continuous pulse oximetry measurements shall be available for all residents receiving Chronic Ventilator Care and provided based on the needs of each resident. For residents receiving Ventilator Weaning or Sub-Acute Tracheal Suctioning, continuous pulse oximetry shall be provided, and end tidal Carbon Dioxide (etCO₂) measurements shall be provided no less than every four (4) hours, and within one (1) hour following all vent parameter changes, or for residents receiving Sub-Acute Tracheal Suctioning, after all tracheostomy tube changes, tracheostomy capping trials, or the use of speaking devices.

~~Arterial Blood Gas (ABG) shall be readily available in order to document the resident's acid base status and/or End Tidal Carbon Dioxide (etCO₂) and continuous pulse oximetry measurements should be performed in lieu of ABG studies.~~

56. An audible, redundant external alarm system shall be connected to emergency power and/or battery back-up and located outside of each the room of each resident who is ventilator-dependent resident's room for the purpose of alerting caregivers of resident disconnection- staff of resident ventilator circuit disconnection or ventilator failure.

67. Ventilator equipment (and ideally physiologic monitoring equipment) shall be connected to electrical outlets connected to back-up generator power via clearly marked wall outlets.

78. Ventilators shall be equipped with adequate back-up systems provisions, including:

- (i) Internal and/or external battery back-up systems to provide a minimum of eight (8) hours of power;

- (ii) Sufficient emergency oxygen delivery devices (i.e., compressed gas or battery operated concentrators);
- (iii) At least one (1) battery operated suction device available per every eight (8) residents on mechanical ventilator or with a tracheostomy; and
- (iv) A minimum of one (1) patient-ready back-up ventilator which shall be available in the facility at all times.

89. The NF shall be equipped to employ the use of current ventilator technology consistent with meeting residents' needs for mobility and comfort with current ventilator technology to encourage and enable maximum mobility and comfort, ideally weighing less than fifteen (15) pounds with various mounting options for portability (e.g., wheelchair, bedside table, or backpack).

910. The facility shall have an emergency preparedness plan specific to residents receiving Enhanced Respiratory Care (i.e., Ventilator Weaning, Chronic Ventilator Care, or Sub-Acute Tracheal Suctioning) which shall specifically address total power failures (loss of power and generator), as well as other emergency circumstances. A (one) back-up ventilator shall be available at all times in the facility.

11. The facility shall have a written training program, including an annual demonstration of competencies, for all staff caring for residents receiving Enhanced Respiratory Care (i.e., Ventilator Weaning, Chronic Ventilator Care, or Sub-Acute Tracheal Suctioning), which shall include alarm response, positioning and transfers, care within licensure scope, and rescue breathing.

- (d) A NF contracted with one or more TennCare MCOs to receive Ventilator Weaning, Chronic Ventilator Care, or Sub-Acute Tracheal Suctioning Reimbursement must be operating in compliance with Department of Health rule 1200-08-06-.06(12) in order to be eligible for Ventilator Weaning, Chronic Ventilator Care, or Sub-Acute Tracheal Suctioning Reimbursement. In addition, the NF shall provide attestation of its compliance with each of the requirements specified in Subparagraph (c) or shall submit a plan of correction regarding how it will achieve compliance with any condition not currently specified in 1200-08-06-.06(12) no later than January 1, 2017, and shall maintain compliance on a continuous basis thereafter. As of January 1, 2017, a NF must be operating in compliance with all of the conditions specified in Subparagraph (c) in order to be eligible for Ventilator Weaning, Chronic Ventilator Care, or Sub-Acute Tracheal Suctioning Reimbursement.

Except as provided in (c) above, the standards set forth in (c) are not applicable for Tracheal Suctioning Reimbursement; however, the NF must ensure the availability of necessary equipment, supplies, and appropriately trained and licensed nurses or licensed respiratory therapists to perform the specified tasks.

- (e) The standards set forth in Subparagraph (c) are not applicable for Secretion Management Tracheal Suctioning Reimbursement; however, the NF must meet standards specified in Subparagraph (f) below for Secretion Management Tracheal Suctioning Reimbursement.

If the resident has available resources to apply toward payment, including Patient Liability as determined by DHS, or TPL, which may include LTC insurance benefits, the payment made by the Bureau is the per diem rate established by the Bureau minus the resident's available resources.

- (f) A NF contracted with one or more TennCare MCOs to receive only Secretion Management Tracheal Suctioning Reimbursement shall meet or exceed the following minimum standards:

1. A licensed respiratory care practitioner as defined by T.C.A. § 63-27-102, shall be on site a minimum of weekly to provide:

- (i) Clinical Assessment of each resident receiving Secretion Management Tracheal Suctioning (including Pulse Oximetry measurements);

- (ii) Evaluation of appropriate humidification;
 - (iii) Tracheostomy site and neck skin assessment;
 - (iv) Care plan updates; and
 - (v) Ongoing education and training on patient assessment, equipment and treatment.
2. The NF shall ensure that an appropriate individualized POC is prepared for each resident receiving Secretion Management Tracheal Suctioning. The POC shall be developed with input and participation from a licensed respiratory care practitioner as defined by T.C.A. § 63-27-102. Medical direction, including POC development and oversight for persons receiving Sub-Acute Tracheal Suctioning shall be conducted in accordance with Subparagraph (c).
 3. The NF shall establish admissions criteria which meet the standard of care to ensure the medical stability of residents who will receive Secretion Management Tracheal Suctioning prior to transfer from an acute care setting. The NF shall maintain pre-admission documentation regarding the clinical evaluation of each resident who will receive Secretion Management Tracheal Suctioning for appropriateness of placement in the facility.
 4. Pulse oximetry measurements shall be provided at least daily with continuous monitoring available, based on the needs of each resident. For any resident being weaned from the tracheostomy, the following shall be provided:
 - (i) Continuous pulse oximetry monitoring; and
 - (ii) End tidal Carbon Dioxide (etCO₂) measurements at least every four (4) hours and within one (1) hour following tracheostomy tube changes, tracheostomy capping trials, or the use of speaking devices. Transcutaneous (tcCO₂) shall not be appropriate for intermittent monitoring.
 5. Mechanical airway clearance devices and/or heated high flow molecular humidification via the tracheostomy shall also be available for secretion management, as appropriate for the needs of each resident.
 6. Oxygen equipment shall be connected to back-up generator power via clearly marked wall outlets.
 7. Adequate back-up provisions shall be in place including:
 - (i) Sufficient emergency oxygen delivery devices (i.e. compressed gas or battery operated concentrators); and
 - (ii) At least one (1) battery operated suction device available per every eight (8) residents on mechanical ventilation or with a tracheostomy.
 8. The facility shall have an emergency preparedness plan specific to residents receiving Secretion Management Tracheal Suctioning which shall specifically address total power failures (loss of power and generator), as well as other emergency circumstances.
 9. The facility shall have a written training program, including an annual demonstration of competencies, for all staff caring for residents receiving Secretion Management Tracheal Suctioning which shall include alarm response, positioning and transfers, care within licensure scope, and rescue breathing.
- (g) When a NF establishes a "Tracheostomy Unit" by accepting Tracheal Suctioning Reimbursement, including Sub-Acute and Secretion Management, for more than three (3) residents on the same day the licensed respiratory care practitioner described in Part (f)1 shall be on site a minimum of daily for assessment, care management, and care planning of residents receiving Tracheal Suctioning.
 - (h) A NF contracted with one or more TennCare MCOs to receive Secretion Management Tracheal

Suctioning Reimbursement shall provide attestation of its compliance with each of the requirements specified in Subparagraph (f) above, or shall submit a plan of correction regarding how it will achieve compliance no later than January 1, 2017, and shall maintain compliance on a continuous basis thereafter. As of January 1, 2017, a NF must be operating in compliance with all of the conditions specified in Subparagraph (f) in order to be eligible for Secretion Management Tracheal Suctioning Reimbursement.

- (i) Eligibility for and access to ERC services by individuals from out of state is governed by 42 C.F.R. § 435.403. A NF shall not recruit individuals from other states to receive Enhanced Respiratory Care in Tennessee. A NF shall not be eligible to receive TennCare reimbursement for Enhanced Respiratory Care services for a resident placed by another state or any agency acting on behalf of another state in making the placement because such services are not available in the individual's current state of residence, including residents admitted to the NF/SNF under the Medicare Skilled Nursing Facility care benefit when such benefit has been exhausted. The NF shall be responsible for arranging, prior to the resident's admission to the facility, Medicaid reimbursement for Enhanced Respiratory Care services from the Medicaid Agency of the state which placed the resident and which will commence when other payment sources (e.g., Medicare, private pay, but not TennCare) have been exhausted.
- (8) Enhanced Respiratory Care Reimbursement in a dual certified and licensed NF/SNF shall be made only by TennCare MCOs in accordance with this Chapter and rates established by the Bureau. Effective July 1, 2016, each level of Enhanced Respiratory Care Reimbursement shall be an add-on payment to the NF's established Level 2 per diem rate or the NF's blended per diem rate, when established. The amount of the NF's add-on payment for each of the specified levels of reimbursement shall be based on the facility's performance on quality outcome and technology measures pursuant to a methodology established by TennCare. Quality outcome and technology measures, performance benchmarks, and the methodology to apply such measures and benchmarks to each of the specified levels of Enhanced Respiratory Care Reimbursement may be adjusted during FY 2016-2017 to ensure compliance with the Appropriations Act, Public Chapter 758, and no more frequently than annually thereafter in order to continuously improve the quality of care and quality of life outcomes experienced by individuals receiving Enhanced Respiratory Care in a NF.

~~Reimbursement for enhanced respiratory care services in a Medicare certified and licensed Level 2 SNF shall be made only by TennCare MCOs in accordance with this Chapter and rates established by the Bureau.~~

1200-13-01-.05 TennCare CHOICES Program.

- (4) Enrollment in TennCare CHOICES. Enrollment into CHOICES shall be processed by the Bureau as follows:
- (c) Individual Cost Neutrality Cap.
3. Calculating a Group 2 Member's Individual Cost Neutrality Cap.
- (i) Each Group 2 Member will have an Individual Cost Neutrality Cap that is based on the average cost of the level of NF reimbursement that would be paid if the Member were institutionalized in a NF as set forth in Items (I) through (III) below. CHOICES Group 2 does not offer an alternative to hospital level of care.
- (III) A Member determined by TennCare to meet the medical eligibility criteria in Rule 1200-13-01-.10(5)(c) who would qualify for Chronic Ventilator Care or a Member determined by the Bureau to meet the medical eligibility criteria in Rule 1200-13-01-.10(5)(d) who would qualify for Secretion Management Tracheal Suctioning will have a Cost Neutrality Cap that reflects the higher payment that would be made to a NF for such care. For at least FY 2016-2017, the Cost Neutrality Cap for such CHOICES Group 2 member shall be based on the annualized cost of the applicable Enhanced Respiratory Care rate in effect as of June 30, 2016. Beginning July 1, 2017, the Cost Neutrality Cap for such CHOICES Group 2 member may be established based on the average annualized cost of the applicable level of Enhanced Respiratory Care Reimbursement using payments for

such level of reimbursement during the FY 2016-2017 year. The Cost Neutrality Cap for such CHOICES Group 2 member shall be adjusted no more frequently than annually thereafter. There is no Cost Neutrality Cap based on the cost of Ventilator Weaning Reimbursement or Sub-Acute Tracheal Suctioning Reimbursement, as such services are available only on a short-term basis in a SNF or acute care setting.

~~A Member who would qualify for the Enhanced Respiratory Care Reimbursement for persons who are chronically ventilator dependent, or for persons who have a functioning tracheostomy that requires frequent suctioning through the tracheostomy will have a Cost Neutrality Cap that reflects the higher payment that would be made to the NF for such care. There is no Cost Neutrality Cap for Ventilator Weaning Reimbursement, as such service is available only on a short-term basis in a SNF or acute care setting.~~

1200-13-01-.10 Medical (Level of Care) Eligibility Criteria for TennCare Reimbursement of Care in Nursing Facilities, CHOICES HCBS and PACE.

(5) Criteria for Medicaid Level 2 and Enhanced Respiratory Care Reimbursement of Care in a NF.

(b) An Applicant must meet both of the following criteria in order to be approved for Medicaid Level 2 reimbursement of care in a NF:

2. Need for Inpatient Skilled Nursing or Rehabilitative Services on a Daily Basis: The Applicant must have a physical or mental condition, disability, or impairment that requires skilled nursing or rehabilitative services on a daily basis or skilled rehabilitative services at least five days per week when skilled rehabilitative services constitute the primary basis for the approval of the PAE. The Applicant must require such services at a greater frequency, duration, or intensity than, for practical purposes, would be provided through a daily home health visit. In addition, the Applicant must be mentally or physically unable to perform the needed skilled services or the Applicant must require skilled services which, in accordance with accepted medical practice, are not usually and customarily self-performed. For interpretation of this rule, the following shall apply:

(iii) A skilled rehabilitative service must be expected to improve the Applicant's condition. Restorative and maintenance nursing procedures (e.g., routine range of motion exercises; stand-by assistance during ambulation; applications of splints/braces by nurses and nurses' aides) shall not be considered sufficient to fulfill the requirement of (5)(b)2. Factors to be considered in the decision as to whether a rehabilitative service meets, or continues to meet, the requirement of (5)(b)2. shall include, but not be limited to, an assessment of the type of therapy and its frequency, the remoteness of the injury or impairment, and the reasonable potential for improvement in the Applicant's functional capabilities or medical condition.

(c) In order to be approved for TennCare-reimbursed care in a NF at the Chronic Ventilator rate of reimbursement, an Applicant must be ventilator dependent for at least 12 hours each day with an invasive patient end of the circuit (i.e., tracheostomy cannula). On a case-by-case basis, TennCare may, subject to additional medical review, authorize Chronic Ventilator Reimbursement for an Applicant who is ventilator dependent with a progressive neuromuscular disorder, spinal cord injury, or chronic respiratory failure and is ventilated using noninvasive positive pressure ventilation (NIPPV) by mask or mouthpiece for at least 12 hours each day in order to avoid or delay tracheostomy.

(d) In order to be approved by the Bureau for TennCare-reimbursed care in a NF at the Secretion Management Tracheal Suctioning rate of reimbursement:

1. An Applicant must have a functioning tracheostomy and a copious volume of secretions, and require either:

(i) Invasive tracheal suctioning, at a minimum, once every three (3) hours with documented

assessment pre- and post-suctioning; or

- (ii) The use of mechanical airway clearance devices and/or heated high flow molecular humidification via the tracheostomy, at a minimum, three (3) times per day with documented assessment pre-and post.

 - (I) A copious volume of secretions shall be defined as 25 to 30 ml per day occurring over the course of the day, and not necessarily at every suctioning.
 - (II) The requirement for invasive tracheal suctioning, at a minimum, once every three (3) hours shall be applied as a marker of the severity of the Applicant's respiratory care needs. Secretion Management Tracheal Suctioning is not a scheduled intervention and shall not be performed as a medication would be delivered, i.e., at scheduled intervals (except as prescribed by an appropriately licensed health care professional practicing within the scope of his or her license). Rather, tracheal suctioning should be provided as clinically indicated, based on the needs of each person requiring such care; evidence of the need should be clearly and accurately documented. This could mean a shorter or longer interval at any point, but with a clinical need for invasive tracheal suctioning an average of every three (3) hours or more often in order to qualify for Secretion Management Tracheal Suctioning Reimbursement, except when mechanical airway clearance devices and/or heated high flow molecular humidification via the tracheostomy are used to manage secretions.
 - (III) When mechanical airway clearance devices and/or heated high flow molecular humidification via the tracheostomy are used to manage secretions, there must be documented evidence of the Applicant's copious secretions, but they are managed non-invasively using a cough assist device periodically or high flow molecular humidity continuously or at least three (3) times per day as ongoing treatment. The device is expected to provide ongoing relief of the copious volume of secretions, which shall not negate the need for intervention (and eligibility for Secretion Management Tracheal Suctioning Reimbursement), if absent the high flow device, the copious volume of secretions would require more invasive management.
2. The suctioning (or airway clearance, as applicable) must be required to remove excess secretions and/or aspirate from the trachea, which cannot be removed by the Applicant's spontaneous effort. Suctioning of the nasal or oral cavity does not qualify for this higher level of reimbursement. An MCO may authorize, based on medical necessity, short-term payment at the Sub-Acute Tracheal Suctioning Enhanced Respiratory Care rate for a person who has just been weaned from the ventilator, but who still requires short-term intensive respiratory intervention during the post-weaning period which shall include documented progress in weaning from the tracheostomy.
3. A PAE for Secretion Management Tracheal Suctioning Reimbursement shall be approved for no more than a period of thirty (30) days. Clinical review and approval of a new PAE shall be required for ongoing coverage, which shall include evaluation of clinical progress and the NF's efforts to improve secretion management through alternative methods. TennCare may, on a case-by-case basis, approve a PAE for Secretion Management Tracheal Suctioning Management Reimbursement for a period of more than thirty (30) days, e.g., if a person has ALS (amyotrophic lateral sclerosis) or another progressive neuromuscular disorder, spinal cord injury, or chronic respiratory failure, or is in a persistent vegetative state, and evidence clearly supports that ongoing secretion management tracheal suctioning is expected to continue.
4. A NF who has an approved PAE for Tracheal Suctioning Reimbursement for any resident as of July 1, 2016 shall be entitled to continue to receive such level of reimbursement no later than July 31, 2016 (or any earlier date that may be specified in the approved PAE). The NF shall submit a new PAE for such resident no later than July 19, 2016 in order to determine whether Secretion Management Tracheal Suctioning Reimbursement will be continued, or whether a different level of NF reimbursement is appropriate.

~~In order to be approved by the Bureau for TennCare reimbursed care in a NF at the Tracheal Suctioning rate of reimbursement, an Applicant must have a functioning tracheostomy and require suctioning through the tracheostomy, at a minimum, multiple times per eight (8) hour shift. The suctioning must be required to remove excess secretions and/or aspirate from the trachea, which cannot be removed by the Applicant's spontaneous effort. Suctioning of the nasal or oral cavity does not qualify for this higher level of reimbursement. An MCO may authorize, based on medical necessity, short term payment at the Tracheal Suctioning Enhanced Respiratory Care rate for a person who has just been weaned from the ventilator, but who still requires short term intensive respiratory intervention during the post-weaning period.~~

- (e) ~~Determination of medical necessity and authorization for TennCare Reimbursement of Ventilator Weaning services Reimbursement, or short-term payment at the Sub-Acute Tracheal Suctioning Enhanced Respiratory Care rate for a person who has just been weaned from the ventilator, but who still requires short-term intensive respiratory intervention shall be managed by the Enrollee's MCO.~~

GW10316222redline(2)pk.dkt

I certify that this is an accurate and complete copy of rulemaking hearing rules, lawfully promulgated and adopted by the Tennessee Department of finance and Administration (board/commission/ other authority) on 09/22/2016 (mm/dd/yyyy), and is in compliance with the provisions of T.C.A. § 4-5-222.

I further certify the following:

Notice of Rulemaking Hearing filed with the Department of State on: 07/15/16

Rulemaking Hearing(s) Conducted on: (add more dates). 09/12/16



Date: 9/22/16

Signature: Wendy Long MD

Name of Officer: Wendy Long, M.D., M.P.H.

Director, Bureau of TennCare

Title of Officer: Tennessee Department of Finance and Administration

Subscribed and sworn to before me on: 9/22/16

Notary Public Signature: Kathy Crockarell

My commission expires on: 1/08/2019

All rulemaking hearing rules provided for herein have been examined by the Attorney General and Reporter of the State of Tennessee and are approved as to legality pursuant to the provisions of the Administrative Procedures Act, Tennessee Code Annotated, Title 4, Chapter 5.

Herbert H. Slatery III
Herbert H. Slatery III
Attorney General and Reporter

9/29/2016 Date

Department of State Use Only

Filed with the Department of State on: 9/30/16

Effective on: 12/29/16

Tre Hargett
Tre Hargett
Secretary of State

RECEIVED
2016 SEP 30 AM 8:59
SECRETARY OF STATE
PUBLICATIONS

assessment pre- and post-suctioning; or

- (ii) The use of mechanical airway clearance devices and/or heated high flow molecular humidification via the tracheostomy, at a minimum, three (3) times per day with documented assessment pre-and post.
 - (I) A copious volume of secretions shall be defined as 25 to 30 ml per day occurring over the course of the day, and not necessarily at every suctioning.
 - (II) The requirement for invasive tracheal suctioning, at a minimum, once every three (3) hours shall be applied as a marker of the severity of the Applicant's respiratory care needs. Secretion Management Tracheal Suctioning is not a scheduled intervention and shall not be performed as a medication would be delivered, i.e., at scheduled intervals (except as prescribed by an appropriately licensed health care professional practicing within the scope of his or her license). Rather, tracheal suctioning should be provided as clinically indicated, based on the needs of each person requiring such care; evidence of the need should be clearly and accurately documented. This could mean a shorter or longer interval at any point, but with a clinical need for invasive tracheal suctioning an average of every three (3) hours or more often in order to qualify for Secretion Management Tracheal Suctioning Reimbursement, except when mechanical airway clearance devices and/or heated high flow molecular humidification via the tracheostomy are used to manage secretions.
 - (III) When mechanical airway clearance devices and/or heated high flow molecular humidification via the tracheostomy are used to manage secretions, there must be documented evidence of the Applicant's copious secretions, but they are managed non-invasively using a cough assist device periodically or high flow molecular humidity continuously or at least three (3) times per day as ongoing treatment. The device is expected to provide ongoing relief of the copious volume of secretions, which shall not negate the need for intervention (and eligibility for Secretion Management Tracheal Suctioning Reimbursement), if absent the high flow device, the copious volume of secretions would require more invasive management.
2. The suctioning (or airway clearance, as applicable) must be required to remove excess secretions and/or aspirate from the trachea, which cannot be removed by the Applicant's spontaneous effort. Suctioning of the nasal or oral cavity does not qualify for this higher level of reimbursement. An MCO may authorize, based on medical necessity, short-term payment at the Sub-Acute Tracheal Suctioning Enhanced Respiratory Care rate for a person who has just been weaned from the ventilator, but who still requires short-term intensive respiratory intervention during the post-weaning period which shall include documented progress in weaning from the tracheostomy.
3. A PAE for Secretion Management Tracheal Suctioning Reimbursement shall be approved for no more than a period of thirty (30) days. Clinical review and approval of a new PAE shall be required for ongoing coverage, which shall include evaluation of clinical progress and the NF's efforts to improve secretion management through alternative methods. TennCare may, on a case-by-case basis, approve a PAE for Secretion Management Tracheal Suctioning Management Reimbursement for a period of more than thirty (30) days, e.g., if a person has ALS (amyotrophic lateral sclerosis) or another progressive neuromuscular disorder, spinal cord injury, or chronic respiratory failure, or is in a persistent vegetative state, and evidence clearly supports that ongoing secretion management tracheal suctioning is expected to continue.
4. A NF who has an approved PAE for Tracheal Suctioning Reimbursement for any resident as of July 1, 2016 shall be entitled to continue to receive such level of reimbursement no later than July 31, 2016 (or any earlier date that may be specified in the approved PAE). The NF shall submit a new PAE for such resident no later than July 19, 2016 in order to determine whether Secretion Management Tracheal Suctioning Reimbursement will be continued, or whether a different level of NF reimbursement is appropriate.

~~In order to be approved by the Bureau for TennCare reimbursed care in a NF at the Tracheal Suctioning rate of reimbursement, an Applicant must have a functioning tracheostomy and require suctioning through the tracheostomy, at a minimum, multiple times per eight (8) hour shift. The suctioning must be required to remove excess secretions and/or aspirate from the trachea, which cannot be removed by the Applicant's spontaneous effort. Suctioning of the nasal or oral cavity does not qualify for this higher level of reimbursement. An MCO may authorize, based on medical necessity, short term payment at the Tracheal Suctioning Enhanced Respiratory Care rate for a person who has just been weaned from the ventilator, but who still requires short term intensive respiratory intervention during the post-weaning period.~~

- (e) Determination of medical necessity and authorization for ~~TennCare Reimbursement~~ of Ventilator Weaning services Reimbursement, or short-term payment at the Sub-Acute Tracheal Suctioning Enhanced Respiratory Care rate for a person who has just been weaned from the ventilator, but who still requires short-term intensive respiratory intervention shall be managed by the Enrollee's MCO.

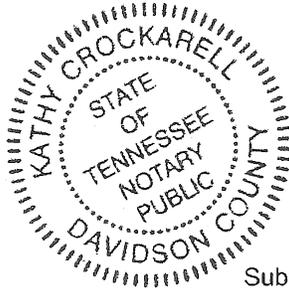
GW10316222redline(2)pk.dkt

I certify that this is an accurate and complete copy of rulemaking hearing rules, lawfully promulgated and adopted by the Tennessee Department of finance and Administration (board/commission/ other authority) on 09/22/2016 (mm/dd/yyyy), and is in compliance with the provisions of T.C.A. § 4-5-222.

I further certify the following:

Notice of Rulemaking Hearing filed with the Department of State on: 07/15/16

Rulemaking Hearing(s) Conducted on: (add more dates). 09/12/16



Date: 9/22/16

Signature: Wendy Long MD

Name of Officer: Wendy Long, M.D., M.P.H.

Director, Bureau of TennCare

Title of Officer: Tennessee Department of Finance and Administration

Subscribed and sworn to before me on: 9/22/16

Notary Public Signature: Kathy Crockarell

My commission expires on: 1/08/2019

All rulemaking hearing rules provided for herein have been examined by the Attorney General and Reporter of the State of Tennessee and are approved as to legality pursuant to the provisions of the Administrative Procedures Act, Tennessee Code Annotated, Title 4, Chapter 5.

Herbert H. Slatery III
Herbert H. Slatery III
Attorney General and Reporter

9/29/2016
Date

Department of State Use Only

Filed with the Department of State on: 9/30/16

Effective on: 12/29/16

Tre Hargett
Tre Hargett
Secretary of State

RECEIVED
2016 SEP 30 AM 8:59
SECRETARY OF STATE
PUBLICATIONS